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INDEX

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PROC. ENG. & TECH. LIB.
CURRENT SERIAL ACQUIS.

U.S. DEPT. OF AGRICULTURE
NAT'L AGRIC. LIBRARY

- 'Improved Service' Sparks Berks County Agricultural Service Center. Feb—4
- "Living Textbook" Opens in Pennsylvania. With Clarence Wilson. June—4
- Burdick, M. D.: *New Upper Colorado Plant Center Focuses on Native Plants for Reclamation.* Dec—6
- CBers Band Together on Flood Warning Network
Lowell Edminster and Frederick Bubb. July—17
- Calculating Conservation. John M. Cross. Apr—6
- CALIFORNIA—
- Pondweed Project.* Nov—19
- suitable shrubs for wildlife. Sept—18
- Unemployed Hired for Conservation Work.* Robert E. Long. Apr—10
- Campbell, Toy N., Jr.: *Trout and Title X.* May—18
- Cash, Kenneth L.: *Stabilizing Stockpiles on the Texas Coast.* With Thomas P. Smith II. Dec—16
- CHANNELIZATION to take excess water off flat (Minn.) fields in Tamarac River Watershed Project. Oct—4
- Charles, Phyllis: *Garden at Hanalei.* Dec—8
- Christmas Trees In Colorado.* Nov—21
- Civilian Conservation Corps constructed waterholding contour furrows and benches reseeded (Idaho). Jun—17
- Clausen, Bernard: *Conservation Education Interest Sparked by Iowa's County Committees.* With Charles McLaughlin. Aug—14
- Clawson, Marion: *Forests For Whom And For What?* Reviewed by William J. Lloyd. Mar—22
- COLORADO—
- Christmas Trees in Colorado.*—Nov—21
- Contest of encouragement for better windbreak care. July—10
- Environmental Plant Center. Dec—6
- Kiowa County soils mapped by the "Eads Bunch." June—10
- Nine outdoor classrooms established in Poudre R-1 School District in Fort Collins. Sept—20
- River Basin salinity control program FY 1975 SCS activities. Feb—20
- Title X Funds in Archuleta County.* Dec—11
- Communication and Conservation in the Nebraska Sandhills.* John M. Cross. Sept—12
- Conly, Lisa wins FFA Soil Judging Contest (La.). Mar—6
- CONNECTICUT—
- Dam of Plenty.* July—18
- CONSERVATION—
- and Environment.* Russell E. Train. Nov. 8
- Benefits at Blackwater.* Don Schuhart and Shirley Foster Fields. May—12
- Blossoms on 'Flower Farm.'* William Westrate. Dec—10
- Choices' Theme of SCSA Meeting.* May—22
- Communication and Conservation in the Nebraska Sandhills.* Sept—12
- Districts Participate in Environmental Education Week.* May—22
- Education Interest Sparked by Iowa's County Committees.* Bernard Clausen and Charles McLaughlin. Aug—14
- education through youth commission (S.C.). July—5
- measures applied on national wildlife refuges. Sept—7
- measures cost (Md.). May—7
- On National Wildlife Refuges.* Vincent J. Price. Sept—4
- plan developed by ASARCO (Ariz.) for mine 'spoils. Oct—8
- plans being used by farmers along the main channel of watershed project (Minn.). Oct—6
- Plant Materials Make Good on 'Moonscape.'* Thomas W. Badger. Jan—6
- practices used to protect N.D. town. Feb—9
- Texas Conservation Awards Program (1975). Sept—15
- Tours Attract 3,500 North Dakota Students.* E. R. Umland. Nov—21
- trail ride (Nev.). May—9
- With CETA.* Dick Crowley. Mar—9
- work for unemployed (Calif.). Apr—10
- Continuing Conservation on the Pocatello Benches.* Gale V. Roberts. June—16
- Coon Creek: Marker in the Pages of Soil Conservation.* June—8
- Cover crops sowed in corn (Pa.). Mar—4
- Credits for an Outdoor Classroom.* Tom Marcum. Aug—9
- Croeni, Kenneth: *Searching for Suitable Shrubs.* With Larry McKibben. Sept—18
- Cross, John M.—
- Calculating Conservation.* Apr—6
- Communication and Conservation in the Nebraska Sandhills.* Sept—12
- Need for a New Approach Stressed at Great Plains Windbreak Symposium.* June—21
- Crowley, Dick: *Conservation With CETA.* Mar—9
- Curris, Dr. Constantine: *Dividends for the Future.* Aug—8
- Curtis, Jan: *1975 Education Awards In Environmental Conservation.* Feb—6
- DAM(S)—
- improves fish habitat and controls lakes levels (Oreg.). Apr—18
- of Plenty.* LaVerne S. Anderson. July—18
- of (Minn.). Tamarac River Watershed Project to hold back floodwater and create bodies of water for human and wildlife use. Oct—5
- Davis, R. M.—
- Broadening Role in Conservation.* Aug—2
- Farming To Save Fuel.* Oct—2
- Identifying Prime Farmland.* Dec—2
- Investment in the Future.* Apr—2
- Lessons on the Land.* May—2
- Mainstay of Agriculture . . . and Conservation.* July—2
- Soils: Limitations vs. Potentials.* Nov—2
- Still Young at Forty.* Feb—2
- Subtle Signs of Conservation.* Mar—2
- Windbreaks: Fact and Fancy.* June—2
- Windbreaks for the Plains.* Sept—2
- Youth: Partners in Conservation.* Jan—2
- Department of Environmental Protection (Me.) assists Project PREPARE. Aug—11
- Desota Bend National Wildlife Refuge (Nebr.). Sept—6
- Dever, Roxie: *Wyoming Students Delve Into 'Energy and Us.'* With Elizabeth Horsch and Phoebe Holzinger. Aug—16

DISTRICT(S)—

Arkansas Association of Conservation Districts sponsors wildlife project (Ark.). May—15

Big Thompson Soil Conservation District sponsored outdoor classroom contests (Colo.). Sept—22

Butler County Conservation District (Kans.) promoted and sponsored seven watershed districts in the county. May—21

Butler County Conservation District (Ky.) support and help to schools' environmental studies. Aug—9

Carson Valley Conservation District (Nev.) helped sponsor first conservation trail ride. May—9

Cherry County Soil and Water Conservation District signed contract with AT&T for Sandhills (Nebr.) restoration work. Sept—12

Chesterfield Soil and Water Conservation District (S.C.) wildlife refuge cooperative agreement. Sept—4

contributions to conservation and environment. Nov—8

Douglas Creek and White River Soil Conservation Districts set up plant center (Colo.). Dec—6

East Kauai Soil and Water Conservation District (Hawaii). Dec—8

East Linn Soil and Water Conservation District (Oreg.) cosponsored Periwinkle measure. Apr—18

Floyd County Soil Conservation District (Iowa) financially contributing to erosion and flooding project. Apr—5

Grand Prairie Water Control District cosponsored Periwinkle measure (Oreg.). Apr—18

Hall-Childress Soil and Water Conservation District 1975 Texas champion district. Sept—15

Jasper Soil Conservation District (Iowa) aids conservation education program. Aug—15

Lee County Soil and Water Conservation District Board organized youth Conservation Commission (S.C.). July—4

Licking County Soil and Water Conservation District (Ohio) sponsored "Tree Packing Day." July—22

Lincoln Conservation District developed conservation tour (S.D.). Oct—19

Little Kanawha Soil Conservation District assists railroad in correcting pollution problem (W.Va.). Dec—20

Marshall Soil and Water Conservation District cost-shared watershed project (Minn.). Oct—6

Mercer County Conservation District youth program funded through CETA (Pa.). Mar—9

Middle Niobrara Natural Resources District works with AT&T to keep us Sandhills (Nebr.) restoration. Sept—14

Minnehaha Conservation District (S.D.). Nov—14

Mobile County Soil and Water Conservation District helped with planning and applying conservation practices at outdoor study center (Ala.). Jan—16

Morton County Water Management District assumed local costs of flooding and sediment damage project in North Dakota. Feb—9

National Association of Conservation Districts 1975 Education Awards. Feb—6

New River Soil and Water Conservation District started program to reclaim Ashe County's trout streams (N.C.). May—18

Northeast Soil and Water Conservation District's Parish project (La.). Oct—16

Ocean County Conservation District (N.J.) received first National Arbor Day Award. July—10

Pamlico Soil and Water Conservation District guides outdoor classroom activities (N.C.). Nov—20

Portneuf Soil and Water Conservation District developed the Pocatello Bench Sediment and Erosion Control Guide (Idaho). June—17

Prince George Soil Conservation District has set up guidelines to aid persons involved in soil and water conservation decisions in an urban area (Md.). Sept—11

St. Charles County Soil and Water Conservation District named first woman supervisor (Mo.). Oct—10

St. Mary Soil and Water Conservation District's Youth Board (La.). Jan—4

San Juan Soil Conservation District (Colo.) received Title X funds. Dec—11

San Patricio Soil and Water Conservation District assists in stabilizing stockpiles of bauxite (Tex.). Dec—16

Seminole County Soil and Water Conservation District (Fla.) soil "potentials" project. July—17

Thompson Creek Watershed District assisted in comprehensive land treatment program in Tennessee. Oct—18

Upper West Fork Soil and Water Conservation District helps sponsor ecology camp for Boy Scouts (Tex.). Mar—12

Weakley County Soil Conservation District assisted in comprehensive land treatment program in Tennessee. Oct—18

Westmoreland County Conservation District helped in community support of mobile laboratory project (Pa.). Mar—11

worked closely with developer to control erosion and sedimentation (Md.). May—5

Yuma County Soil Conservation District (Colo.) judged windbreak contest entries twice a year. July—10

DIVERSION(S)—

system working on stabilized stockpiles erosion project (Tex.). Dec—16

10,000 feet completed in North Dakota to reduce flooding in Glen Ullin. Feb—9

Dividends for the Future. Dr. Constantine Curris. Aug—8

Doughnuts for Ducks. Allen Vaughn. June—18

Down to Earth With Lisa. Gene Warren. Mar—6

DRAINAGE—

measures taken on Oregon's Periwinkle Creek. Apr—18

problems in Laurel, Maryland. Sept—11

Drought (Kans.) creates vigorous watershed promoters. May—21

Eads Bunch. Diana Morse. June—10

ECONOMIC(S)—

Low maintenance plants for open areas. Jan—18

Title X funds to hire the unemployed in Colorado. Dec—11

Edminster, Lowell: *CBers Band Together on Flood Warning Network.* With Frederick Bubb. July—7

EDUCATION—

Colorado State University offers training to develop school sites as outdoor classrooms. Sept—20
conservation programs developed to meet local needs (Iowa). Aug—14
conservation tours for North Dakota students. Nov—21
Credits for an Outdoor Classroom (Ky.). Aug—9
developing capabilities of mentally retarded (La.). Jan—4
Dividends for the Future (Ky.). Aug—8
"Energy and Us" high school project (Wyo.). Aug—16
Environmental Conservation Awards. Feb—6
Environmental education activities in outdoor classroom (S.C.). Aug—19
Environmental Studies Center (Ala.). Jan—16
Federal Women's Program Coordinators Workshop. May—16
5-acre classroom with plans for outdoor classroom facilities included in (Calif.) Title X program. Apr—11
Garden at Hanalei (Hawaii). Dec—8
High school students spread conservation message (S.C.). July—4
How a Pond Turned Into a Classroom (Tenn.). Aug—12
Majors Tackle Environmental Studies at Grambling University. Gene Warren. Aug—7
McKeever Environmental Learning Center (Pa.). June—4
Nationwide effort to help schools plan and use outdoor classrooms. Aug—2
Outdoor classroom (Okla.) offers many different learning opportunities. Jan—14
Outdoor Classrooms on the Outer Banks (N.C.). Nov—20
Outdoor classroom part of Bicentennial celebration (N.C.). June—20
Outdoor laboratory (Tenn.). Dec—18
Potomac River Mark Twain educational adventure. Nov—4
program for awareness of the regional environment (Me.). Aug—10
program in Missouri used to inspire and involve community young and old. Oct—11
Soil survey worked into class on North Dakota's history. Sept—15
'Soils and Society'—'Earthy' New Exhibit At Science Museum of Minnesota. Feb—10
Student Guides in Vermont Lead Natural Resource Studies. Jan—8
Student Trainees in SCS. Dec—12
Summer credit course (Utah) "Environmental Education: Jordan River Project." Aug—4
Eldridge, James H.: *Trailblazing in Tennessee for Outdoor Teaching*. Dec—18

ENERGY—

"and Us" high school project (Wyo.). Aug—16
Farming To Save Fuel. Oct—2

ENVIRONMENT (AL)—

Conservation and Environment. Nov—8
Conservation Awards. Feb—6
Education Majors Tackle Environmental Studies at Grambling University. Aug—7

education activities in outdoor classroom (S.C.).

Aug—19

Education Week. May—22

Improvement Corps (Pa.). Mar—19

issues are political issues (Wyo.). Aug—17

McKeever Environmental Learning Center (Pa.).

June—4

project in Franklin, (La.). Oct—6

social and physical factor main elements in designing the new city of Columbia (Md.). May—5

Studies Center (Ala.). Jan—16

study area—Jordan River (Utah). Aug—4

services FY 1975 activities. Feb—19

values and attitudes teaching center for teachers and students (Pa.). June—4

Environmental Protection Agency—

cooperating agency for Potomac River adventure.

Nov—7

sponsored and helped develop model state legislation with SCS and NACD. Nov—9

EROSION—

and flooding cut by Iowa's farm-city project. Apr—4
and siltation course offered from mobile lab (Pa.).

Mar—11

and siltation in trout stream (N.C.). May—20

Bauxite stockpiles (Tex.) susceptible to wind and water erosion. Dec—16

problems at a cavalry lookout post (Tex.) attacked by Boy Scouts at ecology camp. Mar—12

problems in District of Columbia. Oct—12

Scarcity of knowledge. July—12

and Sediment Control Guides Published in More Than 13 States. Oct—7

Siltation in fishing streams (W.Va.). Dec—20

Soil Erosion Control Demonstration Area (Wisc.).

June—8

Wind erosion problem on flower farm (Mich.).

Dec—10

Extension Services—

assists with North Carolina soil survey project.

Apr—15

assists with RC&D conservation education workshops (N.H.). Aug—22

Fager, Leon F.; *Floating Islands for Waterfowl in Arizona*. With John C. York. Dec—4

Farm-City Project in Iowa Cuts Erosion and Flooding. Jim Allen. Apr—4

Farmers Home Administration—

made loans available for rebuilding and repairing of flood damage (Mo.). Sept—9

Farming To Save Fuel. R. M. Davis. Oct—2

Federal Disaster Assistance Administration—

provided 100 percent reimbursement (Mo.) to repair public facilities after it was declared a disaster area from floods. Sept—9

Feedlot designed to use excess forage and avoid polluting (Okla.). Feb—13

Fields, Shirley Foster: *Conservation Benefits at Blackwater*. With Don Schuhart. May—12

50,000 GPGC Contract Signed in Oklahoma.

F. Dwain Phillips. June—19

H. H. Finnell—*Pioneer in Wind Erosion Control Research*. Mar—21

- First woman to head a state soil and water district commission? Mar—8
- Fishing Award*. Mar—21
- Fishing Trip 'Hooks' Into Conservation*. Roger D. Rayburn and Willis J. Ridenour. Dec—20
- Floating Islands for Waterfowl in Arizona*. Leon F. Fager and John C. York. Dec—4
- FLOOD(S)—
- and erosion cut by Iowa's farm-city project. Apr—4
- Ashville Flood Prevention Measure No. 1 (Ala.). June—6
- control project in Idaho. June—17
- control provided with RC&D measure (Oreg.). Apr—18
- Repairs In Missouri*. Patt Ruck. Sept—8
- warning network of CBers (Pa.). July—7
- FLORIDA—
- Pilot Study Concentrates on Soil "Potentials."* July—16
- soil survey supplement for Seminole County. July—16
- soils mapping Duvall County in an ATV. June—15
- Forest Service—
- assists in channeling funds for conservation projects to employ people in rural areas (Calif.). Apr—10
- assists with RC&D conservation education workshops (N.H.). Aug—22
- conducted environmental education workshop for adults at learning center (Pa.). June—5
- personnel assists with weekend conservation course trail rides (Nev.). May—9
- Forests For Whom And For What?* Marion Clawson. Reviewed by William J. Lloyd. Mar—22
- Fort Niobrara National Wildlife Refuge (Nebr.). Sept—5
- Fosher, Dann A.: *Wyoming Ranchers Coordinate Conservation on Public and Private Lands*. With R. Steve Scheldt. July—20
- 4-H clubs help with Iowa wildlife tree planting project. Nov—19
- From a Sandhole To Lush Prairie in 34 Years*. Mary Ann Koch and Kenneth E. Noonan. Sept—16
- FUTURE FARMERS OF AMERICA—
- built nesting boxes for wood ducks (N.C.). Nov—16
- lend many hands to assist development of outdoor classroom for mentally retarded (La.). Jan—4
- plants trees for wildlife (Iowa). Nov—19
- sponsors (La.) soil judging contest. Mar—6
- Gahm, Thomas C.—
- 'Soils and Society'—'Earthy' New Exhibit at Science Museum of Minnestota*. Feb—10
- Taming the Tamarac River*. Oct—4
- Garden at Hanalei*. Phyllis Charles. Dec—8
- Gardening project on floodwater storage area park (Conn.). July—18
- Gillespie, Morris S.—
- Harvesting a Hobby*. June—6
- Outdoors Study Multiplies in Mobile*. Jan—16
- GIRL SCOUTS and Boy Scouts help with Iowa Planting for Wildlife project. Nov—19
- GRASS(ES)—
- Kleingrass adapted successfully in West Central Texas climatic conditions. Jan—21
- legumes, trees, and shrubs revegetate mine spoil (Kans.). Jan—7
- native to the area and wildflowers used for open areas. Jan—18
- Selection 75 kleingrass, buffelgrass, King Ranch blue-stem, Medio bluestem, buffalograss, NK-37 bermudagrass and common bermudagrass seeded in vegetative stabilization plan for Texas' stockpiles erosion problem. Dec—16
- Special type of interseeder applied (Nebr.). Sept—17
- GREAT PLAINS CONSERVATION PROGRAM—
- cost-share money also applied to land leased and grazed under permit (Wyo.). July—20
- 50,000 contract signed in Oklahoma. June—19
- Livestock Pipeline Aids Great Plains Ranchers* (Nebr.). Nov—17
- Rangeland interseeded under GPCP contract (Nebr.). Sept—17
- SCS FY 1975 activities. Feb—18
- GREAT PLAINS—
- soils mapped on more than half a million acres (Colo.). June—10
- windbreak symposium. June—21
- Half a Century of Tree Planting*. Orlin I. Lyng. Jan—10
- Hardee, David: *Outdoor Classrooms on the Outer Banks*. Nov—20
- Harris, Susie: *Arkansas Wildlife Unlimited*. May—15
- Harvesting a Hobby*. Morris S. Gillespie. June—6
- Hauck, William R.: *'Mother Nature Cooperates to the Fullest' in RC&D Conservation Education in N.H.* Aug—21
- HAWAII—
- student participation in school garden project. Dec—8
- Hayes, Ronald W.: *Achieving a Goal of Water Supply*. With Harold D. Heise. May—21
- Health, Education, and Welfare, Office of Education made grant to fund student-operated environmental study (Wyo.). Aug—17
- Heise, Harold D.: *Achieving a Goal of Water Supply*. With Ronald W. Hayes. May—21
- Hellerick, Karl: *Rube Goldberg—Type Invention Sows Cover Crops in Corn*. Mar—4
- Help for Homeowners*. Lawrence M. Roberts. Sept—10
- Highlights—1975*. Summary of Activities of the Soil Conservation Service for fiscal year 1975. Feb—17
- Hill, William L.: *Title X Funds in Archuleta County*. Dec—11
- HISTORIC conservation movement in America. Nov—12
- Hitting the Conservation Trail*. John L. McLain and Wallace Peterson. May—9
- Hobe Sound National Wildlife Refuge (Fla.). Sept—6
- Hofma, Gorgie E.: *Silver Creek Watershed*. Nov—14
- Holzinger, Phoebe: *Wyoming Students Delve Into "Energy and Us."* With Elizabeth Horsch and Roxie Dever. Aug—16
- Horsch, Elizabeth: *Wyoming Students Delve Into 'Energy and Us.'* With Roxie Dever and Phoebe Holzinger. Aug—16
- Hortin, J. Kent: *Jordan River—Utah's Newest Environmental Study Area*. Aug—4

How a Pond Turned Into a Classroom. Mariam Young and Billy F. Smith. Aug—12

IDAHO—

Continuing Conservation on the Pocatello Benches. June—16
Identifying Prime Farmland. R. M. Davis. Dec—2
'Improved Service' Sparks Berks County Agricultural Service Center. Frederick E. Bubbs. Feb—4
International Land, Pasture, and Range Contest (Okla.). July—8
Investment in the Future. R. M. Davis. Apr—2

IOWA—

administers state law by using soil loss equation. Apr—17
Conservation Education Interest Sparked by Iowa's County Committees. Aug—14
cuts erosion and flooding. Apr—4
Farmers Plant 'Acres for Wildlife.' Jim Allen. Nov—18
IRRIGATION—
drip system used to help establish trees and shrubs on mine spoils (Ariz.). Oct—9
sprinkler system installed to irrigate bauxite stockpiles (Tex.). Dec—16
system is a learning opportunity in outdoor classrooms (Colo.). Sept—21
system pays off on "trust" farm in Nebraska. Apr—6
techniques saves water. Mar—21

Jenkins, Anette M.: *SCS Sponsors Workshop for Federal Women's Program Coordinators.* May—16

Jeter, Frank, Jr.—

Apples Add Up on Protected Hillside. Jan—22
Nesting News for Wood Ducks. Nov—16
Pick Shin: on the Bicentennial Tour. June—20
Jones, Ewing: *A Rookie Looks at Soil Erosion.* July—11
Jordan River—Utah's Newest Environmental Study Area. J. Kent Hortin. Aug—4

KANSAS—

Conservation Plant Materials Make Good on 'Moon-scape.' Jan—6
Kennedy Tailing Wheels Park (Calif.) restoration under Title X. Apr—11

KENTUCKY—

Murray State University directed approach toward environmental study. Aug—8
outdoor classroom project is part of internship training. Aug—9
Kercher, William: *Pilot Study Concentrates on Soil "Potentials."* With Fred Merrill. July—16
Kleingrass 'On the Move' in West Central Texas. Charles R. Adams. Jan—21
Koch, Mary Ann: *From a Sand Hole to Lush Prairie in 34 Years.* With Kenneth E. Noonan. Sept—16

L.I.F.E.—

(Let's Improve Franklin's Environment project). Oct—6
That's L.I.F.E. (La.). Mar—20
Lake Liberty. July—23
Land Judging Contest Draws 1,000 Competitors. F. Dwain Phillips. July—8

Land treatment program in (Tenn.) watershed districts. Oct—18

LAND USE—

Committee. Oct—20
Identifying Prime Farmland. Dec—2
position statement of League of Women Voters. Nov—20
League of Women Voters States Position on Land Use. Nov—20
Lehnert, Dick: *Probing for Knowledge of Our Soils.* Mar—16
Lessons on the Land. R. M. Davis. May—2
Lewis, Douglas L.: *Mapping Florida in an ATV.* With Leon T. 'Skip' Stem and Howard Yamataki. June—15
Licsko, Francis R.: *Mobile Conservation Lab At Work In Pennsylvania.* Mar—10
'Limits'. Nov—12
'Limits'. Jan—11
Livestock Pipeline Aids Great Plains Ranchers. Donald E. Stearley and Randy Patefield. Nov—17
"Living Textbook" Opens in Pennsylvania. Frederick Bubbs and Clarence Wilson. June—4
Lloyd, William J.: *Review of Forest For Whom And For What?* Mar—22
Long, Robert E.: *California's Unemployed Hired for Conservation Work.* Apr—10

LOUISIANA—

Down to Earth With Lisa. Mar—6
Grambling University education majors work on conservation projects. Aug—7
L.I.F.E. program wins Keep America Beautiful, Inc., award. Mar—20
Meaning of L.I.F.E. Oct—6
Youth Project With a Big Heart. Jan—4
Lyng, Orlin I.—
Half a Century of Tree Planting. Jan—10
Sparking a Study. Sept—15

Maddy, John: *Selling Conservation With the Soil Loss Equation.* Apr—16

McKibben, Larry: *Searching for Suitable Shrubs.* With Kenneth Croeni. Sept—18

McLain, John L.: *Hitting the Conservation Trail.* With Wallace Peterson. May—9

McLaughlin, Charles: *Conservation Education Interest Sparked by Iowa's County Committees.* With Bernard Clausen. Aug—14

McNary National Wildlife Refuge (Wash.). Sept—5

MAINE—

Project PREPARE and the Presumpscot River. Aug—10
Mainstay of Agriculture . . . and Conservation. R. M. Davis. July—2
Manley, Don: *Speeding Up the Soil Survey.* Apr—15
Mapping Florida in an ATV. Leon T. 'Skip' Stem, Douglas L. Lewis, and Howard Yamataki. June—15
Marcum, Tom: *Credits for an Outdoor Classroom.* Aug—9

Marturano, Arlene: *Reading the Environment.* With Dr. James Ward. Aug—18

MARYLAND—

Conservation Benefits at Blackwater. May—13
Help for Homeowners. Sept—10
New Town Plans For Quality of Life. May—4

Meaning of L.I.F.E. Gene Warren. Oct—6
Mechanics of Frozen Ground. N. A. Tsytovich. Reviewed by Samuel Rieger. Feb—16
 Menard, Donald: *A Youth Project With a Big Heart.* Jan—4
 Merrill, Fred: Pilot Study Concentrates on Soil "Potentials." With William Kercher. July—16
 MICHIGAN—
Conservation Blossoms on 'Flower Farm.' Dec—10
Mobile Conservation Lab At Work in Pennsylvania. Mar—10
 Soils knowledge from the ice age. Mar—17
 Mildner, William F.: Review of *Sedimentation Engineering.* Mar—22
 Miller, Beverly J.: *A 'Snow' Job for Utah Youth.* Jan—12
 MINING—
 Oil and shale mining reclamation study accelerates testing and development of special plants (Colo.). Dec—6
 Reclaimed surface-mined land examined by Potomac tour group. Nov—6
 Reclamation (Wyo.). investigated in school energy project. Aug—16
 Revegetating desert mine spoils (Ariz.). Oct—8
 Surface-mined areas revegetation (Kans.). Jan—7
 MINNESOTA—
 'Soils and Society' exhibit at Science Museum. Feb—10
 stockwater dugouts invite waterfowl. June—18
Taming the Tamarac River. Oct—4
 MISSOURI—
Flood Repairs in Missouri. Sept—8
 Kansas City International Airport "goes native." Jan—18
New Exhibit Attracts Large Crowds. Mar—15
 Mittelstedt, Herbert: *Terraces Protect Glen Ullin.* Feb—9
Mobile Conservation Lab At Work In Pennsylvania. Francis R. Licsko. Mar—10
 Morse, Diana: *The Eads Bunch.* June—10
 'Mother Nature Cooperates to the Fullest' In RC&D Education in N.H. William R. Hauck. Aug—21
Narrow Rows Reduce Runoff on Sorghum Fields. June—7
 National Association of Conservation Districts with EPA and SCS sponsored development of model state legislation. Nov—9
 National Audubon Society (Ala.) helped identify birds on area for outdoor study center. Jan—16
 National Bank of Commerce (Nebr.) involved in trust farm management. Apr—6
 National Park Service assists conservationists on educational trip down Potomac River. Nov—7
National Soil Erosion Conference Honors Walter H. Wischmeier. July—15
 National water assessment inputs of SCS FY 1975. Feb—20
Native Grasses and Wildflowers—Low Maintenance Plants. Kent Alverson. Jan—18
 NEBRASKA—
Communication and Conservation in the Nebraska Sandhills. Sept—13

conservation irrigation pays. Apr—6
From a Sand Hole To Lush Prairie in 34 Years Sept—16
Livestock Pipeline Aids Great Plains Ranchers. Nov—17
Need For a New Approach Stressed at Great Plains Windbreak Symposium. John M. Cross. June—21
Nesting News for Wood Ducks. Frank Jeter, Jr. Nov—16
New Commission for Missouri' Betty Broemmelsiek. Kent Alverson. Oct—10
 NEW HAMPSHIRE—
 'Mother Nature Cooperates to the Fullest' In RC&D Conservation Education in N.H. Aug—21
 NEW JERSEY—
 First district to receive the National Arbor Day Award. July—10
New Town Plans for Quality of Life. Anne Zack. May—4
New Upper Colorado Plant Center Focuses on Native Plants for Reclamation. M. D. Burdick. Dec—6
1975 Education Awards In Environmental Conservation. Jan Curtis. Feb—6
Nonfederal Sources Provide \$5.6 Million For '74 Soil Surveys. Jan—20
 Noonan, Kenneth E.: *From a Sand Hole To Lush Prairie in 34 Years.* With Mary Ann Koch. Sept—16
 NORTH CAROLINA—
 environmental education program developed in Outer Banks. Nov—20
 fruit farm thrives on steep hillside. Jan—22
 outdoor classroom draws on the past. June—20
Speeding Up the Soil Survey. Apr—15
 teacher named 1975 Environmental Conservation Education Teacher of the Year. Feb—6
Trout and Title X. May—18
 20 years of selling conservation. July—6
 wood duck nesting boxes. Nov—16
 NORTH DAKOTA—
Bicentennial Park. Oct—7
Half a Century of Tree Planting. Jan—10
Sparking a Study. Sept—15
 student conservation tours. Nov—21
 terraces, diversions, sediment impoundment, and establishment of grass solution to reduce flooding and sediment damage in Glen Ullin. Feb—9
 water bank farms. Apr—20
 Nowotny, Arnold: *Revegetating Mine Spoils in a Desert Shrubland.* With Bill Wood. Oct—8
 OHIO—
Assembly Line for Seedlings. July—22
 OKLAHOMA—
 dedication of Lake Liberty. July—21
 leads the nation in number of active GPGC contracts. June—19
 'Our Little Paradise.' Jan—14
Recycling Resources Pays Off on Oklahoma Ranch. Feb—13
 25th Annual International Land, Pasture, and Range Contest. July—8
 works of H. H. Finnell on wind erosion control presented to University. Mar—21

OREGON—

Cooperators Named Farm Family of the Year. Oct—7
 Ottoman, James and Patricia, named National Farm
 Family of the Year. Oct—7
Periwinkle Measure. Apr—18
'Our Little Paradise.' Anne Zack. Jan—14
Outdoor Classrooms on the Outer Banks. David Hardee.
 Nov—20
Outdoors Study Multiplies in Mobile. Morris Gillespie.
 Jan—16

Paddling on the Potomac. Debra Arlean Tate. Nov—4
 Pasture and range conservation FY 1975 activities.
 Feb—18
 Patefield, Randy: *Livestock Pipeline Aids Great Plains
 Ranchers.* With Donald E. Stearley. Nov—17
 Patterson, David W.: *Pondweed Project.* Nov—19

PENNSYLVANIA—

Environmental Improvement Corps established.
 Mar—9
 flood warning network. July—7
*'Improved Service' Sparks Berks County Agricultural
 Service Center.* Feb—4
"Living Textbook" Opens in Pennsylvania. June—4
*Rube Goldberg—Type Invention Sows Cover Crops in
 Corn.* Mar—4
Periwinkle Measure. Joan Perry. Apr—18
 Perry, Joan: *The Periwinkle Measure.* Apr—18
 Peterson, Wallace: *Hitting the Conservation Trail.* With
 John L. McLain. May—9
 Phillips, Charles G.: *Wildlife Makes a Comeback on
 Water Bank Farms.* Apr—20
 Phillips, F. Dwain—
50,000 GPCG Contract Signed in Oklahoma. June—19
Land Judging Contest Draws 1,000 Competitors.
 July—8
Pick Shin: on the Bicentennial Tour. Frank Jeter, Jr.
 June—20
Pilot Study Concentrates on Soil "Potentials." William
 Kercher and Fred Merrill. July—16
 Planned grazing advantages. Sept—18

PLANT(S)—

chokecherry and native plum planted for creek bank
 screening and wildlife habitat (Colo.). Sept—22
 materials program part of cooperative ventures on
 national wildlife refuges. Sept—6
 materials SCS 1975 FY activities. Feb—18
 materials specialists developed vegetative stabilization
 plan for stockpile problem (Tex.). Dec—16
 physiology behind planned grazing. Sept—17
 Russian-olive planted as traffic and noise screen and for
 wildlife habitat (Colo.). Sept—21
 special varieties developed for reclamation lands
 (Colo.). Dec—7

PLANT MATERIALS CENTER(S)—

Manhattan Plant Materials Center (Kans.) provided
 seed and technical assistance in planting native
 plants on open area at airport. Jan—19
 Manhattan Plant Materials Center provided 50 species
 for surface-mined area trials (Kans.). Jan—7
 Pleasanton Plant Materials Center evaluates field
 plantings for improved food and cover plants for
 wildlife (Calif.). Sept—18
 Upper Colorado Environmental Plant Center. Dec—6

POLLUTION problems of Potomac River. Nov—6

POND(S)—

Doughnut-shaped stockwater dugouts (Minn.).
 June—18
 for holding runoff water for recycling for industrial
 purposes (Tex.). Dec—16
How a Pond Turned Into a Classroom. Billy F. Smith
 and Mariam Young. Aug—12
Pondweed Project. David W. Patterson. Nov—19
 Prescott, Linda J.: *Student Guides in Vermont Lead
 Natural Resource Studies.* With Robert M. Towne.
 Jan—8
 President's Council on Environmental Quality lends
 hand for Potomac River educational trip. Nov—7
 Price, Vincent J.: *Conservation On National Wildlife
 Refuges.* Sept—4
Prime Lands Seminar Makes Recommendations to USDA.
 R. Neil Sampson. Oct—20
Probing for Knowledge of Our Soils. Dick Lehnert.
 Mar—16
Project PREPARE and the Presumpscot River.
 Samuel Zaitlin. Aug—10
 Public Employment Program funds obtained for tree
 planting program (Iowa). Nov—19

RANGELAND—

brush control (Tex.). Jan—11
 important industry in Nebraska. Sept—16
 Rayburn, Roger D.: *A Fishing Trip 'Hooks' Into Con-
 servation.* With Willis J. Ridenour. Dec—20
Reading the Environment. Arlene Marturano and
 Dr. James Ward. Aug—18
Real Bargain. July—6

RECREATION—

area another benefit of the RC&D Periwinkle Creek
 (Oreg.) measure. Apr—19
 area result of Minnesota watershed project. Oct—5
 Fisherman at pay lakes (Calif.) complained about
 weed condition of ponds. Nov—19
 lakes are a center for community activities (Ala.).
 June—7
 Stocked lake, tennis courts, wildlife trails, picnic areas
 are some of multiple use activities at floodwater
 storage area (Conn.). July—18
 Trout fishing (N.C.). May—19
Recycling Resources Pays Off on Oklahoma Ranch.
 Anne Zack. Feb—12

RESOURCE CONSERVATION AND DEVELOPMENT—

conservation education workshops in New Hampshire.
 Aug—21
 Little Kanawha Resource Conservation and Develop-
 ment Project (W. Va.). Dec—20
 New River Valley RC&D trout stream improvement
 project measure (N.C.). May—18
 North Central Piedmont Resource and Development
 Project (N.C.) provided funds for construction of
 nesting boxes. Nov—16
 Penn Soil Resource Conservation and Development
 RC&D program assisted in the McKeever Environ-
 mental Learning Center operation (Pa.). June—5
 Penns Corner RC&D Project Council works to help
 obtain funds to support college's mobile laboratory
 project (Pa.). Mar—11

Periwinkle Resource Conservation and Development Measure (Oreg.). Apr—18
 SCS FY 1975 activities. Feb—19
 youth members (Pa.) helped complete seven measures of the Penn Soil Resource Conservation and Development Project. Mar—9
 Resource management coordinated plan (Wyo.). July—20
 REAP—(Rural Environmental Assistance Program) assists Great Plains ranchers develop livestock watering system (Nebr.). Nov—17
Revegetating Mine Spoils in a Desert Shrubland. Arnold Nowotny and Bill Wood. Oct—8
 Ridenour, Willis J.: *A Fishing Trip 'Hooks' Into Conservation*. With Roger D. Rayburn. Dec—20
 Rieger, Samuel: Review of *The Mechanics of Frozen Ground*. Feb—16
 Roberts, Gale V.: *Continuing Conservation on the Pocatello Benches*. June—16
 Roberts, Lawrence M.: *Help for Homeowners*. Sept—10
Rookie Looks at Soil Erosion. Ewing Jones. July—11
 Rouse Company builds conservation in new town (Md.). May—5
Rube Goldberg—Type Invention Sows Cover Crops in Corn. Karl Hellerick. Mar—4
 Ruck, Patt: *Flood Repairs In Missouri*. Sept—8
 Ruth, Boyd A.: *Assembly Line for Seedlings*. July—22
 Sampson, R. Neil: *Prime Lands Seminar Makes Recommendations to USDA*. Oct—20
 Sandhills area (Nebr.) soil replaced, mulched, reseeded after transcontinental cable laid. Sept—13
 Sanitary sewer system (Oreg.) eliminates ground water contamination concern. Apr—19
 Scheldt, R. Steve: *Wyoming Ranchers Coordinate Conservation on Public and Private Lands*. With Dann A. Fosher. July—20
 Schuhart, Don: *Conservation Benefits at Blackwater*. With Shirley Foster Fields. May—12
 Schwien, Jerry D.: *SCS Workshop Sparks University Course on Outdoor Classrooms*. Sept—20
Scouts Battle Erosion at Cavalry Lookout Post. Ray J. Svacina. Mar—12
Searching for Suitable Shrubs. Kenneth Croeni and Larry McKibben. Sept—18
Second 'First.' Mar—8
 SEDIMENTATION—
Engineering. American Society of Civil Engineers. Reviewed by William F. Mildner. Mar—22
 study by Dr. Stanley W. Trimble (Wisc.). June—8
 Seeder plans (Pa.). Mar—5
Selling Conservation With the Soil Loss Equation. John Maddy. Apr—16
 Seminar on the Retention of Prime Lands. Oct—20
 Shiawassee National Wildlife Refuge (Mich.). Sept—5
 SHRUBS—
 Bladderpod for upland game and freeway and highway plantings. Sept—19
 Fourwing saltbush increases upland game. Sept—19
 Quailbush, outstanding cover to benefit wildlife. Sept—19
 Wolfberry, new upland game food and cover plant. Sept—19
Silver Creek Watershed. Gorgie E. Hofma. Nov—14

Slide show traces conservation movement. Nov—12
 Smith, Billy F.: *How a Pond Turned Into a Classroom*. with Mariam Young. Aug—12
 Smith, Rush, hobby of timber stand improvement. June—6
 Smith, Thomas P. II: *Stabilizing Stockpiles on the Texas Coast*. With Kenneth L. Cash. Dec—16
'Snow' Job for Utah Youth. Beverly J. Miller. Jan—12
 Snow surveying (Utah). Jan—12
 Snow surveys FY 1975 activities. Feb—20
 SOIL CONSERVATION SERVICE—
 assisted in developing conservation plan for Arizona copper mine. Oct—8
 assisted in development of conservation plan under WBP agreement and provides related technical assistance (N.D.). Apr—21
 assisted in flood repairs (Mo.). Sept—8
 assists Grambling University (La.) develop conservation plan. Aug—7
 assists in conservation work training of Environmental Improvement Corps (Pa.). Mar—9
 assists in developing a "drive-it-yourself" conservation tour (S.D.). Oct—19
 assists in stabilizing bauxite acres (Tex.). Dec—16
 assists Nebraska ranchers with ranch plans. Nov—17
 assists with high school students energy project and environmental study and investigation (Wyo.). Aug—16
 assists with pondweed problem (Calif.). Nov—19
 assists with RC&D conservation education workshops (N.H.). Aug—22
 assists with weekend conservation course trail ride (Nev.). May—9
 biologist assists in plan for wildlife habitat development (Okla.). July—23
 biologists developed "floating island" for wildlife (Ariz.). Dec—4
 channels money through local governments to create conservation projects that will employ people in rural areas (Calif.). Apr—10
 conservationists assist in developing ideas to help young children relate outdoor classroom experience to reading skills (S.C.). Aug—18
 contributed to Universal Soil Loss Equation. July—15
 Cooperative effort between SCS and California Department of Fish and Game. Sept—18
 cooperative work with U.S. Fish and Wildlife Service. Sept—5
 coordinates and helps finance snow surveying monthly trips (Utah). Jan—12
 designed pond that turned into a classroom (Tenn.). Aug—12
 designed waterfowl stockwater dugouts (Minn.). June—18
 district conservationist helped plan for use of every drop of water in irrigation system (Nebr.). Apr—8
 district conservationist (La.) teaches youth about soils and their formation. Mar—8
 district conservationist (Vt.) works with students in soil surveys. Jan—9
 employees were volunteers for "tree packing day" (Ohio). July—22
 Every field office uses Universal Soil Loss Equation. Apr—16

financial assistance and technical help to local sponsors and landowners in Tamarac River Watershed Project (Minn.). Oct—6

gives onsite review and a design for a grass swale to assist (Md.) homeowners with urban conservation problems. Sept—11

guides outdoor classroom activities on Outer Banks (N.C.). Nov—20

helped develop conservation cropping systems and improve pasture and hayland seeding and management (Oreg.). Apr—18

helped district and new city developer with conservation plan. May—6

helped Oklahoma ranchers with conservation plan and technical assistance. Feb—13

helped set up and judge International Land, Pasture, and Range Contest (Okla.). July—8

helped with planning and applying conservation practices at outdoor study center (Ala.). Jan—16

helps North Dakota city with flooding and sediment damage problem. Feb—9

identifies conservation projects for employment prospects (Colo.). Dec—11

in cooperation with USDI designed and supervised wildlife conservation plan for wildlife refuge (Md.). May—13

initiated nationwide effort to help schools plan and use outdoor classrooms. Aug—2

inventories resources on school grounds and helps develop master plan for use and treatment (Tenn.). Dec—18

laid out "benches" for productive fruit orchard (N.C.). Jan—22

mapped 616,020 acres in Sampson County (N.C.). Apr—15

Maryland state office provided information and helped Washington, D.C. with soil survey work. Oct—14

1975 FY Summary of Activities. Feb—17

part of massive effort to map every land acre (Mich.) by the year 2000. Mar—17

pond dams, constructed to SCS standards, held during flood (Ala.). June—7

prepared soil survey and directed flood control project for development of Pocatello benches (Idaho). June—17

prepared vegetation plan for railroad tunnels that were polluting West Virginia's river. Dec—21

provided assistance in selection of wildlife plantings sites (Ark.). May—15

provided technical assistance for soil "potentials" project (Fla.). July—17

provided technical help in developing learning sites (Ky.). Aug—9

provided technical information and ideas for 'Soils and Society' exhibit (Minn.). Feb—10

provides instructors for ecology camp (Tex.). Mar—12

published erosion and sediment control guides. Oct—7

received award for its contribution "toward the future of sport fishing." Mar—21

representatives discuss soil and shore erosion problems with Potomac River educational trip participants. Nov—7

reviewed soils information, timber resources, and hydrology and usefulness of wastewater planning study (Me.). Aug—10

slide show for the Bicentennial. Jan—11

slide shows used by youth commission (S.C.). July—5

soil scientist helped set up soils instruction using mobile laboratory (Pa.). Mar—11

soil survey leader with 11 soil scientists mapped 600,000 acres in Great Plains. June—10

Sponsors Workshop for Federal Women's Program Coordinators. Anette M. Jenkins. May—16

state conservationist (Pa.) worked to make McKeever Environmental Learning Center a reality. June—5

Student Trainees in SCS. Dec—12

technical assistance for the development of Pick Shin Nature Center (N.C.). June—20

technical assistance in Colorado for Environmental Plant Center. Dec—6

technical assistance in the development of watershed land treatment programs (Kans.). May—21

technical assistance to dahlia grower (Mich.). Dec—10

technical help to enrich students "earthly" experiences (Hawaii). Dec—8

technical staff helps in the planning and application of conservation work under GPCP (Okla.). June—19

with EPA and NACD sponsored development of model state legislation. Nov—9

works with AT&T at underground cable sites to prevent erosion. Sept—12

Workshop Sparks University Course on Outdoor Classrooms. Jerry D. Schvien. Sept—20

Soil Conservation Society of America, Razorback Chapter sponsors wildlife project (Ark.). May—15

Soil Erosion Service predecessor of the Soil Conservation Service. July—11

SOIL(S) —

and Society—'Earthy' New Exhibit At Science Museum of Minnesota. Thomas C. Gahm. Feb—10

and wind erosion increase from windbreak removal June—21

erosion and siltation in urban areas onsite courses taught in mobile lab (Pa.). Mar—11

erosion work since days of U.S. Soil Erosion Service. July—11

Limitations vs. Potentials. R. M. Davis. Nov—2

Loss Equation, A=RKLSKP. Apr—16

Pilot Study Concentrates on Soil "Potentials" (Fla.). July—16

Probing for Knowledge of Our Soils (Mich.). Mar—16

slippage in subdivision (Md.). Sept—10

Universal Soil Loss Equation. July—15

Your Soil's Potential. July—16

SOIL SURVEY(S) —

FY 1975 activities. Feb—20

Mapping Florida in an ATV. June—15

modular exhibit (Mo.). Mar—15

Nonfederal Sources Provide \$5.6 Million For '74 Soil Surveys. Jan—20

of 600,000 acres in Great Plains in less than 3 months. June—11

616,020 acres (N.C.), Sampson County mapped. Apr—15

- survey sparks special study (N.D.). Sept—15
Soil Surveying The Nation's Capital. Anne Zack.
 Oct—12
 Sorghum fields study. June—7
- SOUTH CAROLINA—**
Reading the Environment. Aug—18
 Sandhills National Wildlife Refuge. Sept—4
Spotlight on a Youth Conservation Commission
 July—4
- SOUTH DAKOTA—**
Conservation District Sets Up 'Drive It Yourself' Tour.
 Joyce Watkins. Oct—19
Silver Creek Watershed. Nov—14
Speeding Up the Soil Survey. Don Manley. Apr—15
Sparking a Study. Orlin Lyng. Sept—15
Speeding Up the Soil Survey. Don Manley. Apr—15
Spotlight on a Youth Conservation Commission.
 Anne Zack. July—4
Stabilizing Stockpiles on the Texas Coast.
 Kenneth L. Cash and Thomas P. Smith II. Dec—16
 Stearley, Donald E.: *Livestock Pipeline Aids Great
 Plains Ranchers*. With Randy Patefield. Nov—17
 Stem, Leon T. 'Skip': *Mapping Florida in an ATV*. With
 Douglas L. Lewis and Howard Yamataki. June—15
Still Young at Forty. R. M. Davis. Feb—2
*Student Guides in Vermont Lead Natural Resource
 Studies*. Linda J. Prescott and Robert M. Towne.
 Jan—8
Student Trainees in SCS. Manly C. Wilder. Dec—12
Subtle Signs of Conservation. R. M. Davis. Apr—2
 Svacina, Ray J.: *Scouts Battle Erosion at Cavalry Look-
 out Post*. Mar—12
- Taming the Tamarac River*. Thomas C. Gahm. Oct—4
 Tate, Debra Arlean: *Paddling on the Potomac*. Nov—4
- TENNESSEE—**
 schoolhouse built on a lake. Aug—12
Trailblazing in Tennessee For Outdoor Teaching.
 Dec—18
Way a Stream Should Be. Oct—16
- TERRACE(S) —**
 built to control erosion, reduce sedimentation and
 flooding (Iowa). Apr—4
Protect Glen Ullin. Herbert Mittelstedt. Feb—9
 12,000 feet with drains completed to help reduce flood-
 ing and sediment damage in North Dakota. Feb—9
- TEXAS—**
 bauxite stockpiles stabilization. Dec—16
 Boy Scouts' "battle of erosion." Mar—12
*Conservation Awards Program Cites 13 'State Cham-
 pions'*. Sept—15
Kleingrass 'On the Move' in West Central Texas.
 Jan—21
Research Taps Insects For Brush and Weed Control.
 Jan—11
That's L.I.F.E. Mar—20
- TITLE X—**
Funds in Archuleta County. William L. Hill. Dec—11
 Job Opportunities Program (Calif.). Apr—10
 the Job Opportunities Program funded trout stream
 improvement work RC&D project measure (N.C.).
 May—18
- Towne, Robert M.: *Student Guides in Vermont Lead
 Natural Resource Studies*. With Linda J. Prescott.
 Jan—8
Trailblazing in Tennessee for Outdoor Teaching. James
 H. Eldridge. Dec—18
 Train, Russell E.: *Conservation and Environment*.
 Nov—8
- TREE(S) —**
 as a resource. July—10
 Ash and Ponderosa pine windbreak favorite (N.D.).
 Jan—11
 farming operation started as a hobby (Ala.). June—6
 Scotch pines planted for additional income. Nov—21
 seedlings for wildlife plantings (Ohio). July—22
 70,000 trees planted for wildlife (Iowa). Nov—18
 Trimble, Dr. Stanley W., erosion and sedimentation
 paper presented at symposium. June—8
Trout and Title X. Toy N. Campbell, Jr. May—18
 Tunxis Reservoir floodwater retarding structure (Conn.).
 July—18
- Umland, E. R.: *Conservation Tours Attract 3,500 North
 Dakota Students*. Nov—21
 U.S. Army Corps of Engineers awarded contracts for
 levees as result of (Mo.) flood damage. Sept—9
 U.S. Department of Commerce made title X funds avail-
 able in Colorado. Dec—11
 U.S. Fish and Wildlife Service cooperative agreements
 benefiting about half of the federal wildlife refuges.
 Sept—4
 Universal Soil Loss Equation. Apr—16
- UTAH—**
 Jordan River, environmental study area. Aug—4
 snow surveying. Jan—12
- Vaughn, Allen: *Doughnuts for Ducks*. June—18
- VERMONT—**
 50-acre nature complex. Jan—8
- Ward, Dr. James: *Reading the Environment*. With
 Arlene Marturano. Aug—18
- Warren, Gene—
Down to Earth With Lisa. Mar—6
*Education Majors Tackle Environmental Studies at
 Grambling University*. Aug—7
The Meaning of L.I.F.E. Oct—6
- WASHINGTON, D.C.—**
Soil Surveying the Nation's Capital. Oct—12
 Waste recycling system (Okla.). Feb—14
Watch on Water Witches. June—14
- WATER—**
 bank program FY 1975 activities. Feb—19
 bank program (N.D.). Apr—20
 for recreation, esthetics, and sediment control well
 worth cost in developing new city (Md.). May—5
 quality studies in Tennessee streams. Oct—16
 resources FY 1975 activities. Feb—19
 runoff problems in urban (Md.) area. Sept—11
 Supply Outlook (Utah). Jan—12
 witcher. June—14
- WATERSHED—**
 Presumpscot River watershed approach (Me.).
 Aug—10

- projects in the Flint Hills (Kans.) provides a water supply in reservoirs and increased stream flow for livestock. May—21
- Silver Creek Watershed (S.D.). Nov—14
- Tamarac River (Minn.) Watershed Project. Oct—4
- Thompson Creek Watershed (Tenn.). Oct—16
- Watkins, Joyce: *South Dakota Conservation District Sets Up 'Drive It Yourself' Tour.* Oct—19
- 'Way A Stream Should Be.' Jim Bilyeu. Oct—16
- WEST VIRGINIA—
- Agricultural Service Center, Ripley (W. Va.). Apr—12
- steps up erosion control efforts in watershed. Dec—20
- Westmoreland County Community College's (Pa.) laboratory-on-wheels. Mar—10
- Westrate, William: *Conservation Blossoms on 'Flower Farm.'* Dec—10
- Wetlands under WBP agreement (N.D.). Apr—21
- Wilder, Manly C.: *Student Trainees in SCS.* Dec—12
- WILDLIFE—
- Canada geese at nesting grounds (Md.). May—13
- Conservation on National Wildlife Refuges.* Sept—4
- floating islands for protection and nesting cover (Ariz.). Dec—4
- food plots established through "Arkansas Wildlife Unlimited" project. May—15
- Makes a Comeback On Water Bank Farms.* Charles G. Phillips. Apr—20
- Management Area first part of watershed (Minn.) project completed. Oct—5
- management in tree farming operation (Ala.). June—7
- Nesting News for Wood Ducks.* Nov—16
- odd tracts planted for wildlife habitat (Iowa). Nov—18
- plantings in 10-county area (Ohio). July—22
- protection planned in developing of new town of Columbia (Md.). May—8
- Searching for Suitable Shrubs.* Sept—18
- SCS FY 1975 activities. Feb—18
- stockwater dugouts (Minn.). June—18
- Trout and Title X (N.C.). May—18
- Wilson, Clarence: *"Living Textbook" Opens in Pennsylvania.* With Frederick Budd. June—4
- WINDBREAK(S)—
- Fact and Fancy.* R. M. Davis. June—2
- for the Plains.* R. M. Davis. Sept—2
- planted on North Dakota farm since 1928. Jan—10
- symposium. June—21
- to control wind erosion on dahlia farm (Mich.). Dec—10
- Year-long contest to encourage better care of windbreaks (Colo.). July—10
- WISCONSIN—
- Coon Creek erosion and sedimentation study area. June—8
- Wischmeier, Walter H. July—15
- Women—Federal Women's Program Workshop. May—16
- Wood, Bill: *Revegetation Mine Spoils in a Desert Shrubland.* With Arnold Nowotny. Oct—8
- Woodlands and windbreaks FY 1975 activities. Feb—18
- WYOMING—
- Ranchers Coordinate Conservation on Public and Private Lands.* Dann A. Fosher and R. Steve Scheldt. July—20
- Students Delve Into 'Energy and Us.'* Elizabeth Horsch, Roxie Dever, and Phoebe Holzinger. Aug—16
- Yamataki, Howard: *Mapping Florida in an ATV.* With Leon T. 'Skip' Stem and Douglas L. Lewis. June—15
- York, John C.: *Floating Islands for Waterfowl in Arizona.* With Leon F. Fager. Dec—4
- "You Can't Lose."* July—10
- Your Soils' Potential.* July—16
- Young, Mariam: *How a Pond Turned Into a Classroom.* With Billy F. Smith. Aug—12
- YOUTH—
- Board of Supervisors (La.). Jan—4
- Conservation Commission (S.C.). July—4
- employed under CETA (Pa.). Mar—9
- Future Farmers of America soils contest (La.) won for first time by a girl. Mar—6
- Partners in Conservation. R. M. Davis. Jan—2
- Project With a Big Heart. Donald Menard Jan—4
- Scouts Battle Erosion At Cavalry Lookout Post (Tex.). Mar—12
- Soil Conservation District Junior Board members collect data for water supply forecast report (Utah.) Jan—12
- Zack, Anne—
- A New Town Plans for Quality of Life.* May—4
- An Agricultural Service Center—'More Than Several Offices Under One Roof.'* Apr—12
- 'Our Little Paradise.'* Jan—14
- Recycling Resources Pays Off on Oklahoma Ranch.* Feb—12
- Soil Surveying The Nation's Capital.* Oct—12
- Spotlight on a Youth Conservation Commission* July—4
- Zaitlin, Samuel: *Project PREPARE and the Presumpscot River.* Aug—10

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U. S. Department of Agriculture / Soil Conservation Service / August 1975



Broadening Role In Conservation Education

Some 8 years ago, after experiments on school sites in New Jersey, the District of Columbia, and Michigan, the Soil Conservation Service initiated a nationwide effort to help schools plan and use outdoor classrooms.



Today there are outdoor learning areas in just about every conservation district in the United States, a large proportion of them designed with SCS and district help.

Outdoor classrooms today, however, are but a part of the broad field of environmental education. And SCS employees are being called upon to serve environmental education, not only as school site planners and conservationists, but also as resource people—as sources of information about use and care of soil and water resources.

It isn't unusual any more for a district conservationist in a single week to speak to a women's club, a service club, a Scout troop, and

confer with several school officials. Further, most of our people manage to handle these assignments in a way that wins the Service many new friends among teachers and students, young people and adults.

SCS people are learning that helping teachers gain an understanding of conservation is an efficient way of reaching a large audience of future leaders and decisionmakers. This way of multiplying our efforts deserves the attention of every one of us.

The typical citizen today is confronted with a bewildering lineup of controversies over the environment. He receives conflicting information on practically every resource issue, being assured one minute that all is well and the next told that doom is imminent. And on the basis of all these divergent reports the citizen must make informed decisions about the future of our resources.

Obviously, it is impossible to be able to make such decisions without facts. That is where districts and SCS can be of increasing service to all Americans. We cannot afford to shrink from our responsibilities in environmental education. There's too much at stake.

A handwritten signature in dark ink, appearing to read "T. M. Davis". The signature is fluid and cursive, with a large, stylized initial "T" and "M".



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Earl L. Butz

Secretary of Agriculture

R. M. Davis, Administrator
Soil Conservation Service

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Contents

- 2 From the Administrator
- 4 Jordan River—Utah's Newest Environmental Study Area
J. Kent Hortin
- 7 Education Majors Tackle Environmental Studies at Grambling University
Gene Warren
- 8 Dividends for the Future
Dr. Constantine Curris
- 9 Credits for an Outdoor Classroom
Tom Marcum
- 10 Project PREPARE and the Presumpscot River
Samuel Zaitlin
- 12 How a Pond Turned into a Classroom
Mariam Young and Billy F. Smith
- 14 Conservation Education Interest Sparked by Iowa's County Committees
Bernard Clausen and Charles McLaughlin
- 16 Wyoming Students Delve Into 'Energy and Us'
Elizabeth Horsch, Roxie Dever, and Phoebe Holzinger
- 18 Reading the Environment
Arlene Marturano and Dr. James Ward
- 21 'Mother Nature Cooperates to the Fullest' In RC&D Conservation Education in N.H.
William R. Hauck

COVER: In Utah, J. Kent Hortin, SCS district conservationist, meets with students taking a summer credit course on the Jordan River (see story on p. 4).



Canoe trips to observe and study plant and animal life were a part of the Jordan River environmental study project.

Jordan River— Utah's Newest Environmental Study Area

by J. Kent Hortin

District conservationist, SCS, Salt Lake City, Utah

Two years ago students from the four high schools of Jordan School District near Salt Lake City, Utah, pioneered a summer credit course officially titled "Environmental Education: Jordan River Project."

One hundred and thirty students spent 3 weeks studying the river and its environment for 30 miles, from its freshwater source in Utah Lake near the city of Provo to the end of its journey as it disappears into the salt waters of Great Salt Lake.

That pioneer study proved so successful that the Jordan River project not only continued the

following year, but has been funded for both 1975 and 1976.

For more than 128 years the Jordan River has been a source of water for people, a drainage outlet, a dumping ground for sewage, a fishing stream, and a source of irrigation water that spreads green fields across Salt Lake Valley.

The river was named by the first settlers during the 1847 annual conference of the LDS (Mormon) Church. They had noted the similarity to the Biblical Jordan River that runs from the freshwater Sea of Galilee to the salt-laden Dead Sea.

The idea for the environmental study originated with four high school coordinators:

Glen Soulier, science; Boone Colegrove, social studies; George Shell, mathematics; and Lowell Boberg, English. They assembled a team of eight high school teachers, two from each discipline, and met with resource managers from Soil Conservation Service, Forest Service, Bureau of Land Management, Bureau of Reclamation, with representatives of the Salt Lake County Health Department and the Jordan River Parkway, and with officials of an irrigation company.

Through the help of students from the four high schools, a series of 24 varied but river-related projects was developed and student-tested.

For 3 weeks that summer, the 130 students who enrolled in the Jordan River project spent 4 hours each day on some phase of the project. Because their experiences were multidisciplinary, the students could earn one-half unit credit in any one of the four disciplines: English, social studies, science, or mathematics.

The format for the study has remained much the same each year. Some students elect to concentrate on water testing at various points along the Jordan while others study land-use planning in the same area, using soils as a basis.

Students spend one morning on the geologic history of the river revealed on the rocks at Jordan Narrows, a point where the river cuts through mountains on its way to Salt Lake Valley.

Some of the students make studies of the river plants and animal species, including fish habitat. The mathematically inclined often choose surveying

and mapping of the river basin.

History buffs learn about the people who settled the valley and the changes that have occurred there over the years by visiting the State Historical Society. Others collect Indian lore about the river at the Hutchins Museum in the nearby community of Lehi.

Besides the natural resource and historical studies, visits are made to the state prison and to a sewage treatment plant. One project involves locating and measuring the capacity of storm sewers.

Use of water is of particular significance in arid states such as Utah, so part of the project is devoted to understanding how the river water is allocated and used in both agricultural and municipal areas of the valley.

Special attractions during the 3-week course are a 6-mile canoe trip on the river and an overnight campout.

On bird-watch day the students are out early and arrive

by daybreak at Utah Lake to observe larks, bluebirds, bluejays, and the many other birds along the way.

Putting it all together means discussions before and after the project, filming a documentary on the studies, and preparing slide-tape programs. Many students do watercolors of river scenes; others read river poetry and put their feelings and thoughts into poems of their own.

Nor does it stop here. Many of these experiences are relived and taught to new students the succeeding year by teachers who become thoroughly involved in this type of teaching.

Students who enroll for the summer are of two distinct groups—those who love to learn and are eager for new experiences and those who need a chance to make up a half credit, preferably without the drudgery of the traditional classroom. Within a few days the differences disappear. In-

Students gained a broad understanding of the importance of water quality to the people of the river valley areas.

Among the continuing activities during the summer were water testing techniques and data recording.





Through group discussion of literature on famous rivers and creative efforts by students writing poems, stories, and songs, appreciation of the esthetic value of the river environment is encouraged.

terest in activities and the freedom of outdoor investigations soon erase all contrasts among the students.

Teachers can cite many evidences that the overall objectives of the project—to help students gain a sense of the importance of the Jordan River as a natural resource in their environment and their lives—have been achieved.

Positive changes in student attitudes toward the environment develop during the project. These changes are reflected in post-project questionnaires. Most significant, students are working with real-life environmental concerns, the close-to-home problems that can soon be tackled by the young people themselves, rather than a textbook study of remote and complex global issues far removed from their experiences.

Teacher enthusiasm has matched that of the students.

Many of the teachers have commented that the project was both a teaching and learning experience for them.

This year, the Jordan River School District decided to expand the program. The original Jordan River project will be offered in alternate years. Beginning this summer, a companion study course focusing on the three distinct areas of desert, valley, and mountain, all within or adjacent to the Jordan School District boundary, had its first run.

Following the pattern set by the Jordan River project, students worked with the teachers in planning and testing the new multidisciplinary program.

Desert studies will emphasize plant and animal relationships in the arid environment. Native plants such as shadscale, grease wood, and alkali sacaton will be studied in contrast to less desirable invader plants that

RIVER

*The river sloshes at its banks
And runs or wanders through
the ranks
Of oak and sagebrush never
ending,
A world of time it's spending . . .
Peaceful, quiet, or full of strife . . .
Much like the human way of life.*

—John Johanson

Brighton High School
Jordan School District

often follow overgrazing of range lands—such plants as halogeton and woollyloco weed that are poisonous to livestock. The desert as a fragile ecosystem, where any disturbance of vegetation requires many years to repair, will also be a part of the investigation.

The valley study will be a miniature Jordan River project to show how this environment is dependent on the nearby desert and mountain areas.

Investigations of the mountains will show the relationship of the winter snowpack to the water supply for farms and cities in the valley. Students will learn snow survey techniques used to determine the water content of the snow and to help forecast the amount of water available during the coming year.

Of major concern to the students as they explore the mountain environment is the question, "What is to become of the mountains and canyons? Should they be further dotted with summer homes, condominiums, and resorts, or is the area of more importance as a watershed, the source of the valley water supply—or are the two extremes of use by people compatible?" ♦

Education Majors Tackle Environmental Studies At Grambling University

by Gene Warren

Information officer, SCS, Alexandria, Louisiana

One of a growing number of colleges and universities offering future teachers training in environmental studies as part of the Division of Education program is Grambling University in Louisiana.

This university has developed an outdoor learning area where education majors work on conservation projects to gain experience in developing environmental education programs at all grade levels.

Long a cooperator with the D'Arbonne Soil and Water Conservation District, Grambling University has a 200-acre farm for use by its agriculture students. About 50 acres of the farm are devoted to environmental education and special projects.

The environmental studies program began in 1972 when Dr. Charles Berry, director of the University's Division of Education, and Dr. R. L. Bailey, head of the agriculture program and director of the farm, met with SCS District Conservationist P. B. Colvin and Soil Conservationist Leon Blankenship to discuss the idea of using part of the farm for an environmental education program.

A faculty committee, with SCS assistance, developed a conservation plan for the outdoor classroom and selected sites for specific kinds of study.

To insure a multidisciplinary emphasis for the program, Dr. Berry invited division heads

and key faculty members in education and science to review the proposed program.

The first teacher to use the outdoor classroom was Mrs. Pearl Vaughn, recreation coordinator at the college. A group of her students undertook a garden project.

"The farm is a fine place for students to learn about natural resources," Mrs. Vaughn

commented. "One of the objectives is to show the students that the outdoors is beautiful. Some of our students still think of the farm as a place of misery; they are learning that it isn't."

Professor Sara Williams, who works with elementary education majors, has outlined environmental education courses so that the outdoor classroom can be used each semester.

Fourteen study sites are being developed on the 50-acre learning area. These include a pond for aquatic ecosystem studies, a soil profile site, wildlife habitat, woodland, and plant study stations.

"We hope eventually to have all of our 4,000 students taking part in outdoor classroom projects," Dr. Berry said. ♦



Future teachers at Grambling University are developing outdoor classroom projects and resource studies to enable them to carry on environmental education programs when they begin their teaching careers.

Dividends for the Future

by Dr. Constantine Curris
President, Murray State University, Murray, Kentucky

Conservation education is nothing new. It has been here for many years, but our failures have given it new meaning. A generation ago, most students learned virtually nothing about ecology or the need to conserve and manage wisely the natural resources. Occasionally we were exposed to a specialized area of the life sciences or the pure sciences, but no one taught us how all of the concepts fit together to make up a dynamic system, an ecosystem, that makes life continuously possible on this little island, Earth.

We just were never taught ecological interdependence, nature's systems engineering, so that we could understand that everything is tied to everything else, everything has a role to play, and that we ought not to tinker with any part of the system until we know what we're doing and what the consequences are likely to be.

In short, I am suggesting that education in its fullest meaning has a responsibility to prepare today's students to function in tomorrow's world—

indeed, we must teach even those who choose not to be students.

How do we teach people about nature? How can we, working together with a common commitment towards environmental conservation, share our commitment and concern with others in a convincing manner which will lead to stewardship of and appreciation for the environment?

At Murray State University we have begun answering these questions not only through offering environmental education courses, but through a directed approach toward environmental study. The new College of Environmental Sciences is comprised of the departments of agriculture, biology, chemistry, physics, mathematics, geography, and geology. Other disciplines such as economics, sociology, and education are affiliates.

We have appointed a coordinator of environmental programs who works with other colleges of the University and functions as a liaison between the University and state and federal agencies.

Several new teacher education programs dealing specifically with environmental education have been inaugurated through our College of Human Development and Learning, which also provides several summer programs for teachers making use of the environmental education facilities at the TVA-sponsored Land Between the Lakes.

We have a very strong commitment at the University to see that those teachers who go forth into the schools of the nation are well trained in the techniques and process of environmental education so that their students may learn not from a standup lecture in the classroom but from actual participatory experiences in an outdoor classroom.

Too long our high school, our elementary school, and our university students have learned by reading and hearing instead of by doing. Educational research has shown that efficiency of learning varies directly with the number of the senses which are brought to use in interpreting one's observations.

Faculty members of the University and many of the teachers who come to the University for summer courses are aware that individually we do not have the expertise necessary to meet all the needs and answer all the questions. However, by working together with professional conservationists from agencies such as Forest Service, Soil Conservation Service, Fish and Wildlife Service, we can supply the necessary information and expertise to help them become teachers willing to use environmental education programs that include outdoor experiences.

It is not simply a question of

Edited from keynote address given by Dr. Curris at conservation education seminar in cooperation with the Soil Conservation Service at the University of Southwestern Louisiana, Lafayette, Louisiana, November 6, 1974.

technical expertise. The teacher must often be shown that there is nothing to fear outside the classroom, that the trust established between teacher and student in the classroom continues just as well in the outdoors. And, that the outdoor laboratory can be used not only for science, but for math, for increasing reading skill, and for stimulating creative efforts. The use of outdoor laboratories is unlimited and knows no discipline boundaries. Education truly becomes interdisciplinary in an outdoor classroom.

Most university presidents are increasingly aware that the university cannot be all things to all people. Not all universities can have forestry departments, or conservation departments, nor can we all have wildlife studies. But in any community there are individuals with these particular areas of expertise and understanding, so that when we bring them to share a common problem, solutions can be found.

For education is the best instrument for understanding change, for getting people to want to change for the better, for influencing action, and for igniting constructive action. As metropolitan areas increase in density, as more people move about more freely and more quickly over the countryside, the use of the land and its resources becomes increasingly competitive. It is imperative that we direct increased attention to the care and preservation of the resources. Here is where education meets a great challenge. Here is where strong, all-pervasive environmental education programs at national, state, and local levels can provide real dividends for the future. ♦



Willard Lovan, SCS district conservationist, discusses soils and land capabilities with Ronald Tines (left) and intern students Diana Bailey and Linda Markham as they plan an outdoor classroom.

Credits for an Outdoor Classroom

by Tom Marcum

Soil conservationist, SCS, Morgantown, Kentucky

Taking part in a new program, two seniors at Western Kentucky University in Bowling Green developed an outdoor classroom for an elementary school this spring as part of their internship training.

The outdoor classroom project is an innovation for the University's College of Education and was made a part of internship training requirements designed to give seniors practical field experience.

The two students, Linda Markham and Diana Bailey, worked with teachers at Fourth District Elementary School in the small community of Jetson in Butler County.

The idea for the outdoor classroom project originated with one of the teachers at the school, Ronald Tines. A graduate of Western Kentucky University, Tines worked with Dr. Fred Kirchner, chairman of the recreation department in the College of Education, to incorporate the outdoor class-

room development into the University's internship program.

Tines supervised the program with SCS District Conservationist Willard Lovan, who provided technical help in developing the learning sites. The Butler County Conservation District, recognizing the importance of environmental studies in the schools, gave further support and help.

The five elementary schools and the high school in Butler County have agreed to serve as cooperators in providing the opportunity for University students to complete their professional training. The outdoor classroom project is scheduled to be offered each spring semester to graduating seniors.

The project had twofold benefits, Tines commented. It helped develop leadership qualities and self-confidence in the seniors and it stimulated interest and enthusiasm among the students by providing a variety of firsthand learning experiences. ♦

Project PREPARE and the Presumpscot River

by Samuel Zaitlin

Coordinator, Project PREPARE, University of Maine,
Portland-Gorham, Maine



Several municipalities in Maine are now using information gathered by high school students during a watershed study this spring as a basis for helping local officials evaluate water quality problems.

The first study of its kind to be undertaken in Maine, Project PREPARE, which translates as "Presumpscot River Education Program for Awareness of the Regional Environment," is a joint venture of the University of Maine at Portland-Gorham and the Maine Association of Conservation Commissions.

Funding for the project came from the Office of Education, U.S. Department of Health, Education, and Welfare, under the Environmental Education Act.

Focus of the study was the Presumpscot River watershed. Students from six high schools collected water samples, analyzed them for various pollutants, and gathered data on the impact of pollution on the downstream areas as the river makes its way from Sebago

Lake to the estuary on the coast.

The watershed approach was selected because it seemed the most suitable mechanism for water resource management studies and because it enabled students to gain a broad overview of the complexities of resource use and management in relation to the needs of municipalities affected.

Additionally, the watershed approach coincides with state and federal recognition of the need for broader based considerations in local land use decisionmaking.

The aim of Project PREPARE's activities was to establish within participating communities (1) the ability to assess and understand water quality problems and (2) a local group, in this case the schools, capable of serving the needs of the municipality in these problem areas.

Early in the planning of Project PREPARE, the Soil Conservation Service reviewed information on soils, timber resources,

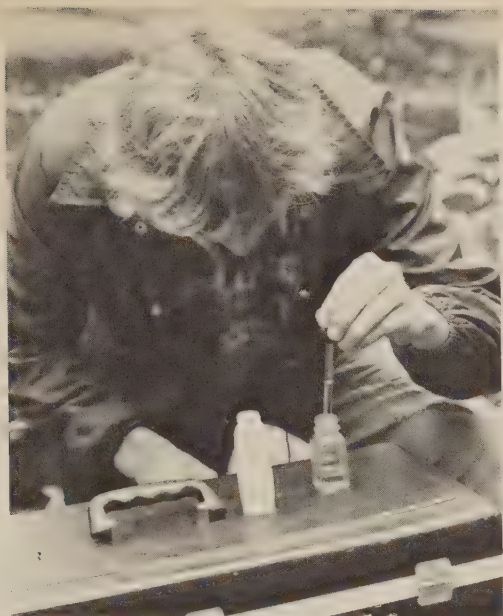
and hydrology and the usefulness of the study for wastewater planning.

Training for the water monitoring project began with a 3-day workshop in October 1974, under the direction of the Institute for Environmental Education, Cleveland, Ohio. The study unit was patterned in part on the Tilton Water Pollution Program published by the Environmental Protection Agency in 1972.

Students and teachers from the six participating high schools took part in classroom sessions and field trips to learn the techniques of water testing. They also learned how to put together inexpensive home-made water testing equipment and measure bacterial and chemical contamination.

Throughout the year, follow-up workshops were held to review testing methods and to explore some of the biological aspects of the Presumpscot River and the estuary.

From the outset, Project PREPARE worked closely with the Maine Department of En-



vironmental Protection (DEP). With DEP assistance, locations were established for testing stations and parameters were set for materials to be tested.

Eleven monitoring sites were chosen. Most of them corresponded to existing DEP stations for reasons of continuity with previous data collected, ease and safety of access, and site suitability. A few monitoring stations were also established on tributary streams at strategic locations.

Each of the six schools set its own monitoring schedule. Some monitored weekly and others biweekly. The usual practice was for students to collect samples in the field and return with them to the school for analysis. Samples were tested for the following parameters: air and water temperature, dissolved oxygen, pH, and total coliform levels. Not only did this in-field/classroom approach insure continuity, but it also allowed participants to share their experiences with

classmates. Data from each group were forwarded to the coordinator who summarized the information for the participants and for DEP.

Sources of pollution, the students found, were primarily from municipal wastes and from pulp and paper mill operations. The students also learned that sewage treatment plants are costly, and that many of the pulp and paper mills have undertaken some control measures. The mills cooperated with the students in their project by supplying information and figures relating to efforts to reduce pollution in the river.

Teacher participation was encouraged by offering three graduate credits for the year-long commitment. The teachers took part in all of the training sessions and worked with students at the testing sites and in the laboratory. At the end of the project, they prepared a summary of activities and an evaluation.

Most teachers emphasized the value of real-world experi-

ences which students could relate to community needs and to the decisionmaking responsibilities of DEP as a state governmental agency.

As an indication of community support and interest, midway through the year several municipalities approached their respective schools with requests for assistance in evaluating local water quality problems. In one instance, the school team chose monitoring stations specifically to provide information to the town fathers as well as the DEP.

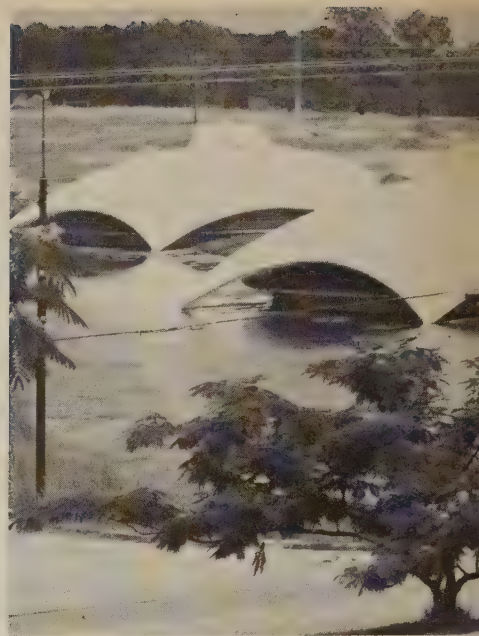
Project PREPARE completed its comprehensive study of the impact of pollution on the lower river and an analysis of the biological improvements taking place in the estuary in late February of this year. The project will be continued next year, with 12 schools scheduled to participate.

The success of the pilot program and the encouraging results contained in the study portend well for the future of the once grossly polluted river in southern Maine. ♦

How a Pond Turned Into a Classroom

by Mariam Young and Billy F. Smith

Science teacher, Montgomery Central High School, Cunningham, Tennessee,
and district conservationist, SCS, Clarksville, Tennessee



Everyone knows about the city set on a hill, but not everyone has heard about the schoolhouse built on a lake.

Montgomery Central High School in Cunningham, Tennessee, sits atop a 3-acre lake that serves as an outdoor classroom. There, the school's 900 students study water ecosystems, collect plant and animal specimens for laboratory study, and enjoy it simply as a beautiful place to be.

The lake began as a pond designed by the Soil Conservation Service in 1950. It was built on the 100-acre site purchased by the Montgomery County School Board in 1939 and used for both elementary and high school buildings.

When a larger high school was needed by 1968, an architect incorporated the pond into the building design, enlarged it to its present size, and perched the circular administration building on the edge of the lake. Three "pods" containing open classrooms, study carrels, and media centers extend out over the water.

The lake is stocked by the Tennessee Wildlife Resource Agency with bass, bluegill, and channel catfish. Muskrat families live along the shore. Waterfowl often stop over a day or two during spring and fall migrations. Students are now placing nesting boxes for wood ducks to encourage permanent residents.

A mile-long learning trail winds along the lake through five different plant and animal communities, beginning with an oak-hickory woodland where violets, spring beauty, may-

apple, and anemones brighten every spring, and where warblers, bluebirds, buntings, and dozens of other birds come to nest.

Out of the woods, the trail crosses a plant succession area that once was cleared for pasture. Farther along on a steep hillside, loblolly and white pine plantings by FFA members about 15 years ago show how one species can shade out other plants, and how tree plantings can slow erosion.

Nearby is a glade where reindeer moss and devil's matchstick grow between rocks and among the cedars. In this area, with its many dogwood trees, students come for discussions, study, poetry readings, picnics, and quiet observation.

In all, ten study sites are used by the students along the trail that ranges from gentle slopes to steep and sometimes eroding banks along a small intermittent stream. SCS conservationists help with soil and water projects, planting, and erosion control.

Elementary school youngsters are often accompanied on the trail by high school students who lead discussions, answer questions, and oversee investigations.

In such a setting, understanding environmental changes and ecosystem interrelationships is very much a part of the daily experiences of students. Teachers are free to take classes outdoors at any time, to assign special projects, and to make the most of that all-too-rare, often neglected "teachable moment." ♦



The 3-acre lake that surrounds Montgomery Central High School in Tennessee serves as an outdoor classroom for water ecosystem studies by elementary and high school students. The lake was developed from an SCS-designed pond when the architect incorporated the water area into the design for the building. It is part of a 100-acre school site that includes a mile-long learning trail and an elementary school in addition to the high school.



Conservation Education Interest Sparked by Iowa's County Committees

by Bernard Clausen and Charles McLaughlin

Associate professor of biology, University of Northern Iowa,
and assistant commissioner, Black Hawk Soil Conservation District, Cedar Falls, Iowa;
and chairman, Conservation Education Committee, Iowa Association of Soil Conservation Districts, Britt, Iowa

Environmental education programs come in all shapes and sizes. This flexibility has one great advantage—that of encouraging programs to meet a variety of needs rather than limiting conservation education efforts to monolithic uniformity.

Iowa is a prime example of a state where conservation education programs have been developed according to local interests and needs.

In 1967 Iowa educators and resource specialists began organizing County Conservation Education Committees. In many of the counties, soil conservation districts, as local governmental units with responsibilities for conservation programs, furnished leadership through their district boards.

Today about two-thirds of

Iowa's 99 counties have some kind of conservation education programming. Some have developed official bylaws with County Conservation Education Committees; others operate informally under the leadership of a chairman.

Palo Alto County Board was the first to organize a Conservation Education Committee. A workbook for upper elementary grades was its first project.

County Conservation Education Committees include people from nearly every profession and age group—school administrators and teachers, high school students, businessmen, farmers, housewives, clergymen, and representatives from many civic and conservation organizations, as well as federal, state, and local resource agencies.

Frequently the administrators of public and parochial school districts are asked to name a representative teacher to serve on the committee. This helps recognize the education committee work as a professional responsibility rather than as a personal community service. A number of teachers serve as assistant commissioners of the soil conservation districts to provide liaison with these groups.

Programs within the counties are as varied as the organizational structures. Many districts devote considerable time and effort to teacher workshops in conservation education.

West Pottawattamie County Environmental Education Committee has for 2 years served as host for regional workshops

sponsored by the Iowa Conservation Education Council (ICEC), a statewide organization working to extend conservation education. West Pottawattamie also publishes a newsletter with conservation information and project ideas for teachers.

County Conservation Education Committee projects and activities include sponsoring speech, poster, essay, and other contests; publishing curriculum guides, coordinating field tours for schools and developing outdoor laboratories for schools, either on the school grounds or in cooperation with city or county park systems.

Jasper County Conservation Education Committee went a step further than most 3 years ago by making formal application for a \$20,000 grant from the Office of Education, U.S. Department of Health, Education, and Welfare, under the Environmental Education Act. With the grant money for the 1973-74 school year, Michael Gross, a local high school biology teacher, was employed to carry out the conservation education program.

During the first year Gross helped 51 classes plan outdoor conservation education activities and developed curriculum resource guides for county schools. A survey in the fall of 1974 showed that two-thirds of the teachers in the county had participated in training through these programs.

The grant, extended for 1 year with reduced funding, expired this year, but the Jasper County Conservation Board, county schools, and the Jasper Soil Conservation District are continuing the program with local funds.

Financial support for County Conservation Education Com-

mittees comes from many sources within the counties, including business firms, civic and community organizations, women's clubs, and county conservation boards.

Many County Conservation Education Committees are now

working to establish adult education programs in conservation. Soil conservation district leaders believe that people who are making decisions in land use and other environmental issues need to be better informed. ♦



Teacher training in conservation is a high priority for education committees in Iowa. The committees help sponsor 300 teachers to 2-day workshops each fall. Below, Beulah Anderson and Greg Martin, both members of the Palo Alto County Conservation Education Committee, update the conservation workbooks which the committee developed for 5th and 6th grade students. These workbooks are used around the state.



Wyoming Students Delve Into 'Energy and Us'

by Elizabeth Horsch, Roxie Dever, and Phoebe Holzinger

Chemistry instructor; social studies department chairman;
and biology consultant, Kelly Walsh High School, Casper, Wyoming

Start with a temperature inversion. Mix in some emissions from a power plant. Add some interested and energetic students, a power company willing to cooperate, a lot of interest and expertise from industry, government agencies, the community, and a small Federal grant to fund the student-operated environmental study, and you have a year-long high school project called "Energy and Us."

Focus of the study was the coal-fired Pacific Power and Light Dave Johnston Power Plant located about 25 miles from Casper, Wyoming, near the small community of Glenrock. Fifty junior and senior students at Kelly Walsh High School in Casper planned, researched, and conducted an intensive multidisciplinary study of the conversion of stored energy to electrical energy.

Since coal for the plant comes from the company-owned surface mine 16 miles away, the students also investigated reclamation of mined land.

To learn what grasses are native to the area and might serve best for mined land rehabilitation, the students checked with Robert Tresler, state agronomist for the Soil Con-

servation Service. Tresler said that, with proper management, such species as thickspike wheatgrass, western wheatgrass, green needlegrass, and fourwing saltbush are among the native species that will work.

When the students wondered how long natural reclamation would take in the dry Wyoming climate, Tresler and George Davis, SCS district conservationist, arranged a bus tour to show examples of recovery of farmland plowed more than 50 years ago. The students found fencelines were still visible though no fences remained, and found several species of grass in the once-plowed area. The mixing of grasses that is beginning to occur is, in the course of natural succession, toward a climax plant community, Davis explained.

The class found, however, that mined land recovery is another story. Old spoil piles left bare of topsoil years ago showed no evidence of returning to productivity. This convinced the students that to achieve acceptable mined land reclamation, protection is needed. In addition, knowledgeable people are necessary

to plan and carry out reclamation efforts.

The class conducted a variety of field studies at the Dave Johnston plant. Students planted pinto beans to test for sulfur dioxide emissions, and gladiolus bulbs on a study plot downwind from the plant to test for fluoride emissions. River water temperatures were monitored and the cooling water discharge made visible by dyeing the water red at the discharge point. Algal growth in the river was compared at points above and below the power plant. Snow samples were analyzed for fly ash content and pH. Dustfall samples were collected and studied. Students even made an attempt at growing plants in fly ash.

To determine the "people" impact of the plant, the class wrote and conducted public opinion surveys covering people's attitudes toward the plant. The students also studied changing economic patterns in the nearby community, receiving some information from the power company, but obtaining much of it by researching community records.

One interesting conclusion reached as a result of comparing tax revenue and school population was that the need for community services in a "boom town" precedes the money necessary to finance these services. Towns faced with sudden growth do not have the financial resources to provide the necessary services. Schools, sewer systems, water systems, recreation facilities, and law enforcement agencies are often inadequate to meet population influxes which accompany rapid growth.

With the beginning of the 20-day budget session of the state legislature, students began to realize that environmental

issues are political issues. To meet the national demand for electrical energy, many coal-fired energy conversion plants are planned for Wyoming, and would have significant impact on the environment. The class studied proposed legislation to regulate the siting of these plants to minimize their impact. The students were keenly disappointed when the bill died in committee on the day of their visit to the legislature.

One of the legislators who spoke to the class after the legislative session challenged the class to "quit sniping and offer some constructive input." As a result, two students, with the help of the class, prepared testimony on plant siting and delivered it before the Joint Interim Mines and Minerals Committee.

Two other students testified

before a U.S. Senate Subcommittee on coal leasing on federal lands to express the concern of the class about the adequacy of Wyoming water reserves to accommodate the proposed utilization of Wyoming coal.

The students made available to the community the results of their study by slide presentations to interested groups, by filing the report of the completed study in the public library, and by serving as student resource people for other schools in the district.

Ultimately, it became apparent to the students that they were the consumers of the product which the power plant was producing and they had to accept some of the responsibility for the environmental impact of the power plant. The Pogo quote "We have met the

enemy and he is us" gained new meaning.

Factors contributing to the success of the energy course were: (1) grant money from the Office of Education, HEW, to provide transportation for the class to various study and project sites, (2) a 2-hour time block which allowed onsite study, (3) community people who served as "walking textbooks," and (4) the realization by students and teachers alike that answers to environmental questions do not come easily.

For the teachers, the project afforded the opportunity to become involved in a very different learning situation. Since they were no longer the "experts," they were free to learn along with — and from — the students. Perhaps this "letting go" was the hardest lesson of all. ♦

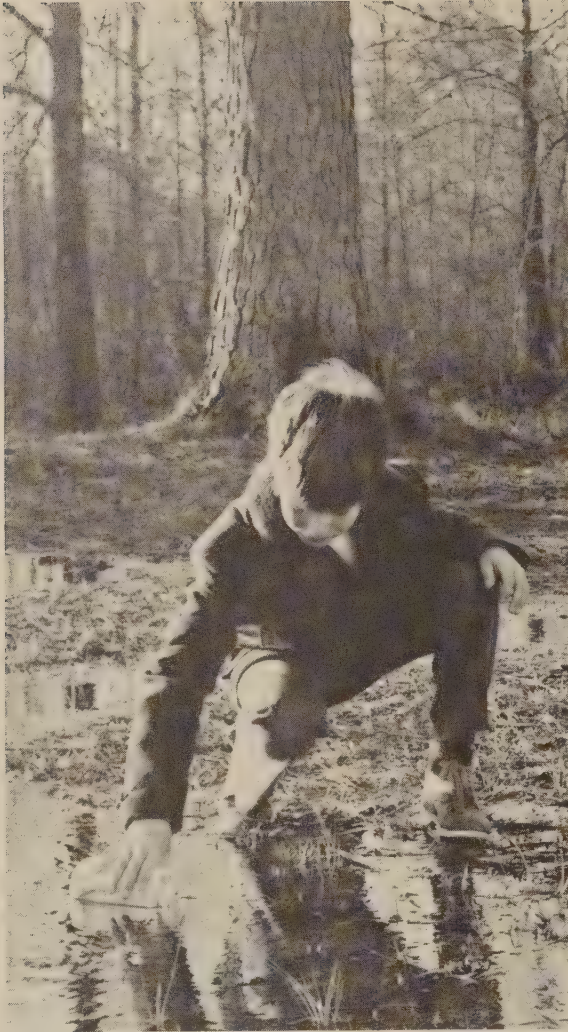
Grasses that help in reclamation of surface-mined land were investigated by high school students in Wyoming during their year-long project, Energy and Us.



Reading the Environment

by Arlene Marturano and Dr. James Ward

Teacher, Gadsden Elementary School,
Gadsden South Carolina,
and professor of education,
University of South Carolina,
Columbia, South Carolina



Teachers frequently ask SCS conservationists for ideas that will help children in primary and early elementary grades relate outdoor classroom experiences to reading skills. Dr. James Ward, professor of education at the University of South Carolina at Columbia, and Arlene Marturano, classroom teacher at Gadsden Elementary School, have developed this series of outdoor learning exercises in observing, classifying, comparing, and generalizing to help beginning readers and students who have difficulty relating to the printed word. Larry Sandifer, SCS state information officer, has worked with Dr. Ward and Miss Marturano and suggested this article for Soil Conservation.



Pond studies help children interpret in words what they observe in the water, over the water, and under the water for a better understanding of space dimensions. Mapping the pond gives students experiences in shifting from reading printed words to "reading" the environment as they study the water ecosystem.

Reading the Water . . . Reading a Toad . . . Reading for Signs of Spring . . . Mapping a Living Room of Water . . . Mapping the Water Cycle. . .

These are titles children have given some of their environmental education activities in the outdoor classroom at Gadsden Elementary School in South Carolina. They have come to realize that they are readers of their surroundings.

Traditionally, reading instruction in schools has focused on proficiency with printed material. However, recent literature in education suggests that reading is an active process of constructing meaning not merely from the printed page but from the child's entire environment.

Furthermore, reading the environment seems a natural prerequisite for success in reading the printed page. As the child's concepts and vocabulary grow, he or she can approach the printed page with a conceptual readiness and confidence that make reading for meaning possible and reading therefore more enjoyable, particularly for the student who has difficulty establishing reading skills.

Environmental education promotes concept development by engaging the child in activities which require reading the surroundings through a variety of conceptual skills. For example, observing, classifying, describing, comparing, and generalizing are the core of conceptual skills essential to all reading.

Since these skills operate primarily through language, facility with language is a coordinate goal of the activities.

One characteristic of language in teaching activities such as these developed at

Gadsden school is its power to alert the senses. Reading the environment requires, in part, the gathering and collecting of sense data which add to environmental awareness as well as to conceptual skills.

Key words that can be suggested by the teacher or the students help to approach and to focus on the surroundings in a meaningful way.

In one exercise, the words "pulling," "framing," "shaping," and "coloring" were patterned in suggested activities such as "Pull words from the clouds," "Frame the flower with words," "Shape the vase with words," or "Color the oak tree with words" to encourage the children to apply their own words to whatever is being observed.

Other words that can be used as "frames" for viewing are "color," "size," "shape," and "happening." Using this device, the students learn to apply specific sensory observations to anything from a grasshopper's leg to tree bark, or to a soil profile, pond water, or almost any natural or man-made phenomena.

"Framing Filmstrips" is a close observation procedure which works well against a soil profile or a tree trunk. For this activity, a column of windows is cut into a sheet of flexible cardboard which is taped or fastened directly against the object to be studied. Parallel to the column of windows, a column of writing frames is positioned. For each viewing frame, the child writes a brief observation or story, and in so doing forms an observational "filmstrip."

This activity may be extended to a series of observations. For example, a soil study series might include filmstrips showing "Layers of Soil in a Gully,"

"Layers of Soil on Terraced Farm Land," or "Layers of Soil on the Bank of a Stream."

Each of these observations emphasizes the verbal mapping of the object through close observation and "linguaging" the description of the object or area viewed. The verbal record, or map, becomes the child's mental map that functions as a probe for further readings.

The identification of sequences in stories is part of traditional reading programs. Environmental experiences emphasize the fact that sequences underlie all life experiences.

These sequences can be read by making use of words as sequence "frames." Such words as "First . . . Second . . . Third," "Before . . . After," "Now . . . Later," and "If . . . Then," when flashed upon a scene bring forth a variety of sequence stories that are part of forests, clouds, water, air—in fact, everywhere. Time, position, correlation, intersection, cause-effect, and, in general, all changes may be perceived and recorded through sequence frames.

Students observing pond water through the "Before . . . After" sequence frame noted "The water was rain before it was a pond," or "The pond formed after the rain."

Looking for the "Befores" and "Afters" helps children perceive relationships. Above all, we want the child's mental map to be a relationships map, not merely a collection of words.

Comparing is another reading skill which often poses problems for beginning readers. When children can relate comparisons to an activity, viewing things to be compared through the frames of "Alike" and "Different," they are able to compare any substances and occur-

rences—water and a raw egg, water and air, water and rock, or bare soil and grassy areas.

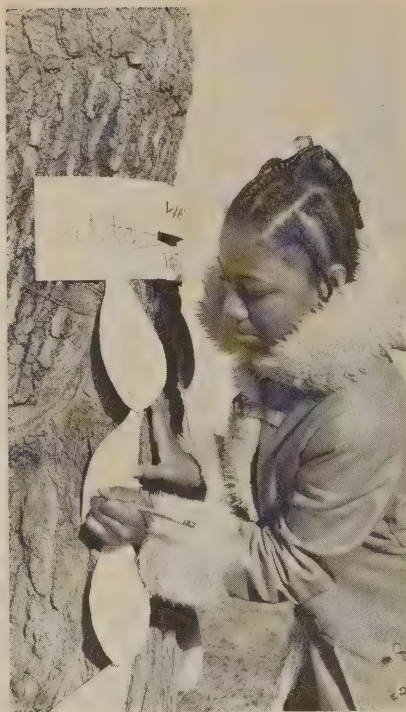
Preposition patterns can be an effective strategy in the outdoor classroom to help children capture relationships and happenings in another dimension. Observing a pond, students interpreted in words what is found in the water, on the water, over the water, under the water.

One particularly difficult language pattern for some children is that of verb tense. Activities that promote the use of tense contribute to the child's ability to perceive past, present, and future sequences and relationships.

By making use of such patterns as "It is a . . .," "It was a . . .," "It could become a . . .," the child lays hold of the concept of cycles. For example, the children found a female black widow spider with her egg sacs and observed her until the spiderlings hatched and the cycle was complete. Any tree can be observed through the same framing device to bring seed, seedling, sapling, and tree into focus. The caterpillar spinning a cocoon can thus be "tensed" in language to reveal the life cycle of butterflies and moths. The children come to understand that the environment of the schoolyard can furnish examples of many kinds of cycles and that language helps in the discovery of such cycles.

Interpretations must be made both in reading the printed page and in reading the environment. As the interpreter, the student must learn to shift fluently and view the information or object from different perspectives, each new perspective yielding new concepts.

The "It is a . . ." pattern can be repeated for the same object



to help the child become adept at shifting perspectives and thereby attaining new information.

A simple exercise was used to develop changing perspectives on a hanging fern basket at Gadsden school. The "It is a . . ." pattern as it was developed by the students showed the fern to be "a chlorophyll maker," "a water drinker," "a fern forest," "a gift," "a beautiful thing," "a plant in a swing," "a cloud maker," "a rain forest plant," "a little garden."

Students will begin experimenting with language patterns once they understand their ability to read their environment.

One such pattern which encourages verbal and laboratory investigations and experiments is that of "What happens when . . ." The teacher may set up observation sessions by asking, "What happens when you boil water?" "What happens when you grow a bean plant in light and another in no light?" "What happens when you let

"Alike" and "different" take on new dimensions when children list, in their own words, descriptions of objects and areas in their outdoor classroom. Here, a student finds new words and phrases to express her feelings about a tree in terms of color, texture, shape, and size.

an open jar of water sit in the room?" This kind of patterning allows for investigation of the interaction between objects, such as water-heat, light-plants, water-air. Students enjoy extending the relationships inquiry to many kinds of phenomena.

Learning to read and interpret word symbols on the printed page is sometimes a major task facing the child when he enters school. Prior to that, the child must, of course, have learned to interpret the sounds of spoken language. Yet the use and understanding of both the spoken and written word are based on first learning to give meaning to surrounding objects and happenings.

By means of his senses the learner encounters the immediate environment and begins to develop the concepts that become his individual code—the environmental code — that enables him to carry on such mental operations as describing, classifying, and generalizing. By reading the environment in the outdoors, another dimension and subsequent extension is added to the perceptions that further skills in interpreting the printed page. ♦



A spider attracts the attention of two teachers in a workshop in environmental education organized and sponsored through the North Country (N.H.) RC&D Project.

'Mother Nature Cooperates to the Fullest' In RC&D Conservation Education in N.H.

by William R. Hauck

RC&D project coordinator, SCS, Littleton, New Hampshire

"Conservation education may be our most important RC&D measure," said James T. Brewer, retired Navy admiral and chairman of the executive board of the North Country (N.H.) Resource Conservation and Development (RC&D) Project.

"It makes sense to instill a conservation outlook in the human mind as well as on the physical environment."

Brewer was expressing his enthusiasm and that of the other 20 members of the executive board following a series of conservation education workshops which the RC&D representatives had helped organize for teachers.

Educators in the four counties of Coos, Grafton, Carroll, and Belknap, which make up the North Country RC&D Project area, had worked with

federal, state, and county agencies in the initial conservation education effort to establish a spreading network of "outdoor classrooms" throughout this area rich in mountains, forests, and lakes. By intent, many of the study areas were installed on school grounds or handy to them.

Next step was to give teachers help and encouragement in using the outdoor laboratories

to full advantage to give young people a broad understanding of conservation management of resources and environmental issues.

For advice in preparing the teachers for outdoor classroom projects, staff members called on veteran educator Leslie Clark of the Society for the Protection of New Hampshire Forests.

Speaking from experience with the Kellogg Conservation Foundation and many years of programming learning activities at the Society's annual encampments, Clark said: "Above all, don't pigeonhole the program into math, science, and what-have-you. Help teachers see that resources run the whole gamut of subject-matter interests—from physics to phys-ed, from language arts to librarianship. And to immerse them, head over heels, in the out-of-doors you want them to understand.

"Make your program a link with the community," Clark added. "Teachers, after all, are in the business of trying to form complete, alert human beings who will some day make better the places where they live."

Taking their cue from Clark, the North Country conservationists launched a series of teacher-and-technician workshops. Their mission was to identify environmental lessons from centuries of man's intrusion within this natural wonderland—and how to open the pages of a "living textbook" visible to communities squarely dependent on their scenic heritage.

Leslie Clark himself served as one of the workshop staffers. Working with him were resource specialists from the Extension Service, Soil Conserva-

tion Service, and Forest Service.

Study areas included abandoned pastures, logged-off woodlots, alder thickets beside trout streams, and crumbling dikes of forgotten mill ponds. On actual sites of generations-old resource use and abuse, teachers and technicians exchanged professional information and ideas.

Equipment used during each field investigation represented the common tools of the trade of working conservationists: maps, tape measures, levels, soil augers, increment borers, and testing kits. Study materials and worksheets included those from the Forest Service "Investigating Your Environment" series.

Format for the workshops remained flexible according to the number of teachers enrolled and time available, but the basic objective was always the same—to demonstrate the tie-ins between the world outdoors and every subject studied in classrooms.

The workshops started with a brief What's-it-all-about session. The teachers were then grouped into four task forces without regard to specialty and assigned to a conservationist specializing in soil, water, plants, or wildlife, moving from one to another in rotation.

Reassembling after the field investigations, the group exchanged information, asked questions, and developed simulated situations for discussions

on actual community problems and their relationship to resources just studied.

At the new multimillion-dollar Middle High School in Gilford, on the shores of Lake Winnepesaukee, Principal Robert Morrison led his staff of 40 teachers in gathering ideas for environmental programs planned for the school's 200-acre outdoor learning site.

Throughout the 2-day session, as the group discovered how to measure streamflow, calculate degree of slope, study food chains, analyze soils, and trace the community's past through signs of land-use changes, Morrison encouraged the teachers to relate all aspects of the study to all subjects at all levels of the 5th through 12th grade student community.

After every workshop, participants commented that Mother Nature always cooperates to the fullest. The elements always put on some kind of sideshow. Rain often stampered the streamflow measurements; a thundering ruffed grouse scared everyone out of a year's growth; there frequently was a hatch of mosquitoes or black flies! A brace of flying squirrels dove on SCS biologist Dave Allen's group just as he was talking about creatures of the dark—those teachers still believe that Dave somehow managed to spring the squirrels out of the tree by pulling a secret lever.

Recently more towns have

A brace of flying squirrels dove on SCS biologist Dave Allen's group just as he was talking about creatures of the dark . . .

sought the unique environmental educational services offered in this area stretching from Lake Winnepesaukee to the Canadian border. In the Lakes region, in the Connecticut Valley, and in the heart of the White Mountains, similar workshops have brought teachers from Ashland, Jefferson, Gilmanton, Lincoln, Woodstock, Thornton, Wentworth, Wolfeboro, and Piermont.

With more than 200 teachers already given resource workshop training, there's a bright prospect that their thousands of students will also learn to heed the necessity for intelligent resource use planning. In that case, a citizenry aroused to the call for environmentally developed communities throughout northern New Hampshire is steadily maturing in local schools. ♦

SCS biologist Dave Allen leads teachers through a rain-soaked forest to study wildlife habitat. The trip was part of a teacher workshop sponsored by the North Country RC&D Project and assisted by resource specialists from several agencies.



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U. S. Department of Agriculture / Soil Conservation Service / September 1975



Windbreaks for the Plains

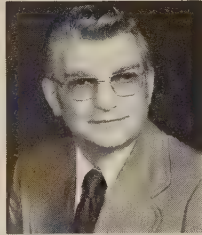
Once upon a time, farmers in the Great Plains would get the plants for their windbreaks by going down to the river and picking up cottonwood and willow "wildlings."

These plants required cultivation and moisture, and farmers nursed them along—carrying water to them in a barrel and even protecting the small plants with windbreaks of their own made from shingles stuck in the ground. The reason for all this trouble was protection: protection against wind erosion, protection for livestock, protection for the farmstead.

Since its earliest years, the Soil Conservation Service has encouraged windbreaks in the Plains. Many SCSers can remember when there were real questions as to whether windbreaks could survive at all in such country. With present technology and plants, however, we now can tailor a windbreak to meet a landowner's specific needs.

Today, no farmstead in the Great Plains can afford to be without a windbreak.

—Windbreaks conserve an estimated 15 to 20 percent in fuel requirements around farmsteads.



R. M. DAVIS

—Windbreaks protect livestock. Many paid for themselves in cattle saved during last winter's severe blizzards.

—Windbreaks are a major protection against wind erosion. With nearly 9 million acres of new cropland going into production last year—much of it in the Plains—additional windbreaks are crucial to protect this highly susceptible area from wind erosion.

Additional benefits include beauty and wildlife habitat. Windbreaks are especially important to pheasants in the winter.

Through his conservation district, a landowner can get assistance in designing, planting, developing, and improving windbreaks to meet his needs in a total conservation plan.

He'll be tapping many links in a conservation chain: the soil survey; the hardier, better adapted plants for windbreaks developed at SCS plant materials centers; sturdy stock, often obtained through his conservation district.

A typical windbreak in the Plains today might include green ash, Siberian elm, eastern redcedar, Russian-olive, and other trees selected for their fruit or beauty.

And it's a lot easier—and more successful—than going down to the river and collecting "wildlings."

A handwritten signature in cursive script, reading "R. M. Davis".

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Earl L. Butz
Secretary of Agriculture

R. M. Davis, Administrator
Soil Conservation Service

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Contents

- 2 From the Administrator
- 4 Conservation on National Wildlife Refuges
Vincent J. Price
- 8 Flood Repairs in Missouri
Patt Ruck
- 10 Help for Homeowners
Lawrence M. Roberts
- 12 Communication and Conservation in the Nebraska Sandhills
John M. Cross
- 16 From a Sand Hole to Lush Prairie in 34 Years
Mary Ann Koch and Kenneth E. Noonan
- 18 Searching for Suitable Shrubs
Kenneth Croeni and Larry McKibben
- 20 SCS Workshop Sparks University Course on Outdoor Classrooms
Jerry Schwien
- 23 Soil Surveys
- 23 Meetings

COVER: Among the Nation's cooperators with soil conservation districts are more than 170 national wildlife refuges. Beneficiaries include such wildlife as this pronghorn antelope at a national wildlife refuge in Nevada. See story on page 4. (U.S. Fish and Wildlife photo by E. P. Haddon)



Conservation On National Wildlife Refuges

by Vincent J. Price

Information Division,
SCS, Washington, D.C.

In April 1946, a landowner in South Carolina signed a cooperative agreement with the Chesterfield Soil and Water Conservation District. The plan which resulted from the agreement included conservation measures such as crop residue management, improved harvesting of woodland, a pond, and a substantial area of wildlife wetland habitat management.

Although it sounds like any number of cooperative agreements which districts deal with every day, this agreement and conservation plan were something special. The land affected was the Carolina Sandhills National Wildlife Refuge; the landowner involved was the U.S. Fish and Wildlife Service; and the cooperative agreement was the first of 172 such agreements benefiting approximately half of the federal wildlife refuges.

Conservation work under these 172 agreements has varied tremendously, from range

At left, migratory waterfowl take off from a national wildlife refuge. Below, mule deer at a refuge in Montana. (U.S. Fish and Wildlife Service photos)

management for elk and buffalo on the Fort Niobrara National Wildlife Refuge in Nebraska to the installation of more than 1.8 million feet of drainage tiles to improve management areas for migratory waterfowl on the Shiawassee National Wildlife Refuge in Michigan. Soils, climate, water resources, vegetation, and wildlife populations are all factors in planning a total conservation plan for a refuge.

The basic inseparability of the resources that comprise natural systems is one of the reasons behind the cooperative work between the Soil Conservation Service, U.S. Department of Agriculture, and the Fish and Wildlife Service, U.S. Department of the Interior.

Results of the conservation teamwork are illustrated at the 3,600-acre McNary National Wildlife Refuge along the Columbia River of Washington. The refuge is a waterfowl wintering area in the Pacific flyway. Since October 1963, it



has been a cooperator with the Walla Walla County Conservation District. Cooperative work has included 635 acres of conservation cropping systems and crop residue management, 3,000 feet of field windbreaks, sprinkler irrigation systems for 6 acres, an irrigation regulating reservoir, and 250 acres of irrigation water management.

Other cooperative ventures on national wildlife refuges include work through SCS's plant materials program.

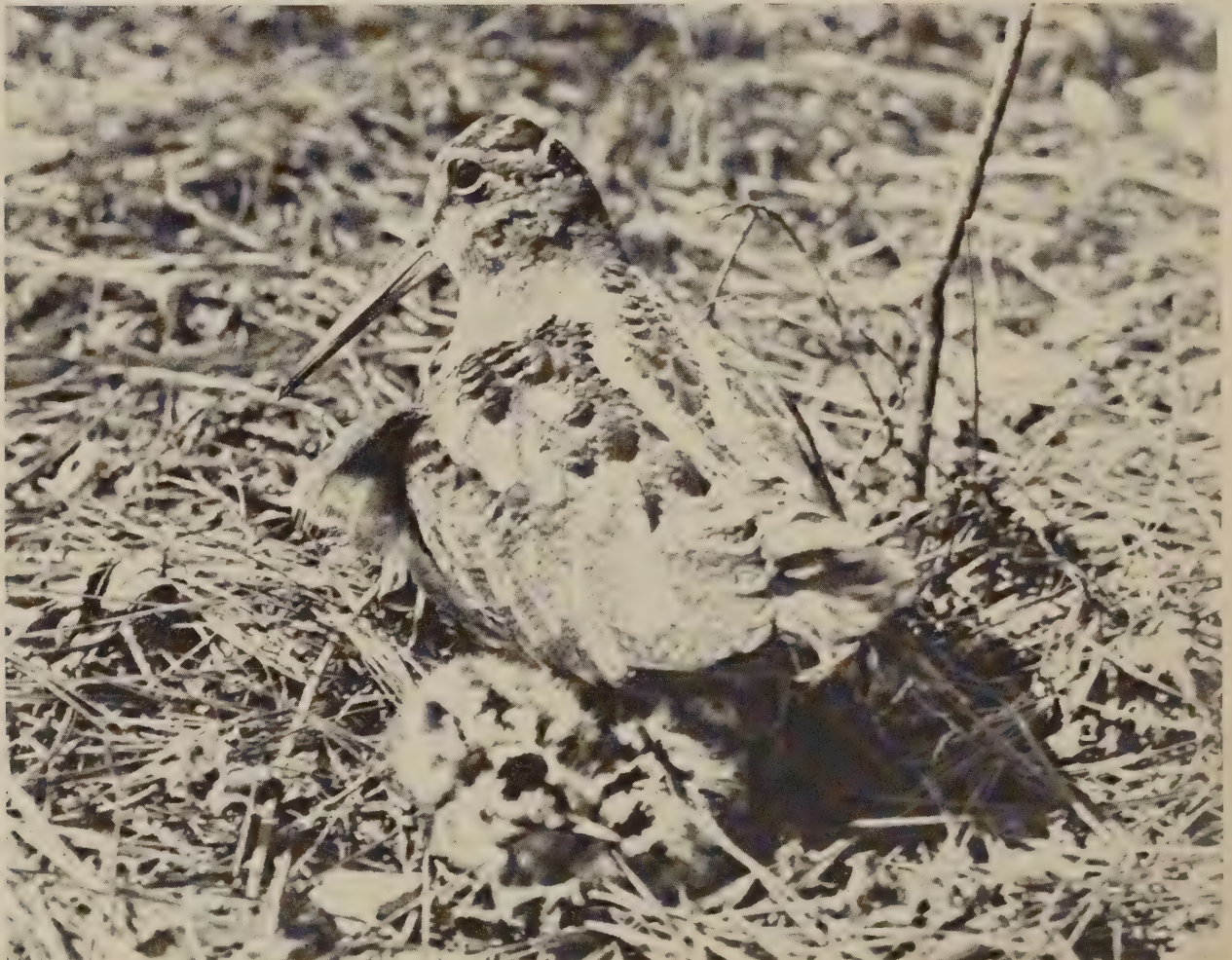
At Hobe Sound National Wildlife Refuge in Florida, SCS has assisted in establishing plantings to protect against beach erosion along areas where sea turtles lay their eggs.

SCS has helped monitor 55 points along 3½ miles of ocean frontage to check changes in vegetation and measure beach erosion.

At DeSoto Bend National Wildlife Refuge in Nebraska and Iowa, SCS has evaluated about 50 woody plants and is evaluating 23 1-acre plots of legumes and forbs for wildlife food and cover.

Through its plant materials program, SCS also has worked with other national wildlife refuges to establish warm season grasses for wildlife food, cover and nesting areas, develop brouse winter feed for geese, and evaluate perennial grasses for wildlife cover and nesting. ♦

A woodcock and young near their nest at Blackwater National Wildlife Refuge in Maryland. (U.S. Fish and Wildlife Service photo by P. J. Van Nuizen)





THE RECORD

Cooperative work of soil and water conservation districts, the Soil Conservation Service, and the Fish and Wildlife Service has resulted in the following conservation measures applied on national wildlife refuges:

373,466 feet of access road
1,165 acres of brush control
41,293 acres of conservation cropping systems
256 acres of contour farming
1,241 acres of critical area planting
24,884 acres of crop residue management
5 diversion dams
11 multipurpose dams
2 debris basins
190,631 acres of deferred grazing
414,835 feet of dikes
74,792 feet of diversions
1,886,141 feet of drains
65,600 feet of drainage field ditches
35 acres of drainage land grading
319,619 feet of drainage mains or laterals
26 acres of farmstead and feedlot windbreaks

339,618 feet of fencing
172,250 feet of field borders
72,185 feet of field windbreaks
45,800 feet of firebreaks
7 fishponds managed
20 grade stabilization structures
103 acres of grassed waterways or outlets
52,800 feet of hedgerow planting
106,024 feet of irrigation canals or laterals
17,234 feet of irrigation canal or lateral lining
25,870 feet of irrigation field ditches
642 acres of irrigation land leveling
2,580 feet of irrigation pipelines
1 irrigation regulating reservoir
14 sprinkler irrigation systems
21 surface and subsurface irrigation systems
8,302 acres of irrigation water management
1,009 acres of land smoothing
52,427 acres of livestock exclusion
4 acres of mulching
26,400 feet of pipeline
26,241 acres of planned grazing systems
2,028 acres of prescribed burning

10 pumping plants for water control
1,179 acres of recreation area improvement
63,380 feet of recreation trails and walkways
2,900 feet of streambank protection
1,532 structures for water control
166,261 feet of gradient terraces
1,327 feet of tree planting
178 wells
7,757 acres of improved woodland harvesting
14,311 acres of woodland improvement
2,982 acres of conservation tillage
16,637 acres of pasture and hayland management
8,844 acres of pasture and hayland planting
299 ponds
850,637 acres of proper grazing use
7,664 acres of range seeding
3 spring developments
3,416 feet of stream channel stabilization
6,155 acres of stripcropping
209,552 acres of upland wildlife habitat management
407,918 acres of wetland wildlife habitat management
76 wildlife watering facilities

Flood Repairs In Missouri

by **Patt Ruck**

State Information Section
SCS, Columbia, Missouri



A logjam—one of the results of flooding last fall in Missouri. SCS was among those agencies assisting in flood repairs.

The 67-year-old woman relaxed in her easy chair. Around her, photographs of her ancestors decked the living room walls. Three generations had lived on this land near Columbia, Missouri.

"Oh, Lord, I wouldn't want to live anywhere else," she said. "If I had to move, I'd pass clear out."

Mrs. Ernestine Gatewood is among many Missourians who have received assistance from the Soil Conservation Service to repair damage from severe flooding during the last 2 years.

During fiscal 1974, SCS obligated more than \$5 million in Missouri for work authorized under Section 216 of the Flood Control Act of 1950. It was the first time that the state had had this specific funding. Three major storms had hit the state between April 1973 and May 1974.

The emergency measure funds were used for reseeding, removing debris from streams, restoring and stabilizing stream banks, renovating drainage ditches, and restoring dams, dikes, and levees.

About 95 percent of the work was removing debris and sediment from major drainage ditches, according to John J. Walker, assistant state conservationist for SCS in Missouri.

About 6 million acres of bottomland are being restored to productivity through Section 216. More than 4 million acres of these are in cropland, mainly corn and soybeans.

Mrs. Gatewood applied for assistance from SCS to clear debris from Gans Creek, which borders part of her 15 acres. A contract was awarded last December.

"Last year and the year be-

fore, the creek started to overflow," Mrs. Gatewood explained. "It made its own path through my 6-acre bottomland."

Russell Hawkins of Ashland, Missouri, is another landowner who had work done through the emergency measure funds. Fowler Creek runs through his 560-acre farm. Debris and sediment were cleared out of the creek last January.

For each emergency measure installation, SCS prepared a report that included the work plan, a cost estimate, public benefits, and an assessment of the environmental effects of the restoration. SCS technicians also supervised the work and inspected completed projects.

The floods that followed the initial floods in 1973 added to the workload of the federal and state agencies aiding landowners in restoring land and

streams and slowed down work already in progress.

In Ray County, for instance, SCS District Conservationist Kenneth Holland noted that adverse weather kept some 400 acres under water until the end of March 1974 and affected more than 4,500 additional acres in the county.

SCS worked closely with the Federal Disaster Assistance Administration (FDAA) to avoid overlap in flood repairs. The FDAA provides 100 percent reimbursement to a state or political subdivision of the state to repair or replace public facilities after a disaster area has been declared. It awarded \$27 million in Missouri for the floods in the spring of 1973 and \$11 million more for the floods that fall and the next spring.

Other agencies assisting in the repair work included the Agricultural Stabilization and Conservation Service, which spent \$4.65 million through its cost-share program for producers to correct "unusual" damage to farmland that has or will impair the productive capacity of the land. Most of these repairs involved grading and shaping of bottomland along the Mississippi and Missouri Rivers. SCS technicians determined eligibility for the program, estimated the cost of repair, and supervised the work done mostly by contractors.

The Farmers Home Administration made available \$22.8 million in loans under the Emergency Loan Program to corporations and partnerships in agriculture, and SCS prepared work plans for these repairs. Most of these repairs were to rebuild levees and clear ditches. In addition, the U.S. Army Corps of Engineers awarded 70 repair contracts for levees as a result of the floods. ♦



Above, SCS assists in removing debris from Big Creek following flooding in Henry County, Missouri. Below, stream stabilization and placement of riprap are complete on this section of Deepwater Creek near Clinton, Missouri. Work was authorized under Section 216 of the Flood Control Act of 1950.





Soil slippage in this subdivision in Prince George's County, Maryland, has affected eight homes.

Help for Homeowners

by Lawrence M. Roberts

Soil conservationist, SCS, Upper Marlboro, Maryland

With a population of more than 700,000 and still increasing, Prince George's County, Maryland, adjacent to the Nation's Capital, is one of the fastest urbanizing counties in the United States.

Its urban conservation problems are also rapidly increasing, as attested to by the growing number of "111 requests" received at the Prince George's Soil Conservation District office in Upper Marlboro. These re-

quests generally have one common denominator: the homeowner needs help.

Three out of four people in Prince George's County are concentrated in subdivisions, apartments, and condominiums, and when they need soil and water conservation assistance, they generally don't have the alternative solutions available in rural areas.

Confronted with such problems as poor drainage, slope

movement, severe erosion, or septic system failures, the homeowner usually finds he needs cooperative efforts to solve the problem.

Eight neighbors in the city of Laurel, for instance, got together to try to correct the problem of standing water in their adjoining backyards. The problem was accentuated by increased road elevations which, over the years, had changed the natural drainage pattern and prevented water

from flowing to the street inlets. In addition, roof drains and old, broken curbs allowed water to flow into the yards.

Seeking technical assistance from the Soil Conservation Service, the neighbors received an onsite review and a design for a grass swale to collect water and convey it to the street.

When the homeowners discovered city ordinances prohibited discharging water over a sidewalk, they met with city officials with the complete description of the problem they had received from SCS. The city officials decided to allow the discharge to be piped under the sidewalk, and agreed to fund the work and repair the broken curbing which had contributed to the drainage problem.

To better assist such landowners in an urban setting, the Prince George's Soil Conservation District has set up guidelines to aid persons involved in soil and water conservation decisions in an urban area.

They include—

No problem is a small problem. A recent call illustrates this. A homeowner reported he had a drainage problem in his backyard, which covered only 200 square feet. Yet this area was causing his children to have severe allergic reactions. The reactions were brought on by the mold and fungus created by standing water.

Know the site. Onsite review is highly desirable and provides information that a layman not well versed in conservation principles may neglect to provide.

Pictures tell the story. We often rely on a set of hand-drawn sketches to explain conservation practices and techniques. This includes rec-

ommendations concerning dry wells, underground drain tile, diversions, and grassed waterways.

Be aware of other agencies. More often than not, the urban dweller seeking assistance will have a problem that requires the input from several local regulating bodies, and it is important to know the roles and

responsibilities of these agencies.

Be your own critic. We have developed a followup program to help us improve and refine techniques in urban soil and water conservation work. We try to get before and after photographs and request the homeowner to call or write when work is completed. ♦



Water runoff is a common problem in urban conservation work. Above, uncontrolled runoff has resulted in erosion damage to this home, including 2 inches of silt deposited on the basement floor. Below, runoff from surrounding properties has resulted in severe damage to this home in a Prince George's County subdivision.





Communication and Conservation in

by John M. Cross

Information specialist, Midwest Technical Service Center,

Modern technology in conservaton and communication has spanned the Nebraska Sandhills.

It all started when the American Telephone and Telegraph Company (AT&T) began putting a high capacity transcontinental cable in the fragile Sandhills in 1968.

Designed to boost service, the cable has 20 coaxial tubes and is capable of transmitting 32,400 telephone conversations at the same time. It runs from Massachusetts to California and took 2 years to complete.

To put in the cable, AT&T needed to dig a 100-mile long, 4-foot-deep trench through the

Sandhills on a 20- to 30-foot right-of-way.

The Sandhills are one of the finest areas in the Nation for livestock production, covering 13 million acres in 20 counties in north central Nebraska. The cable went through five of these counties, in Holt County, then westward across Rock, Brown, and Cherry Counties. As it crossed into Sheridan County it was back in hard-lands again.

The light sandy soils of the Sandhills are 100 feet deep or more and a study in fragility. Remove a square rod of sod and you may start a blowout that will take 100 years to heal.

Without proper care in restoring the sod along the 100-mile trench, it would become a massive blowout area.

To control such problems, AT&T has worked with the Soil Conservation Service for many years to prevent erosion where underground cable work is being done.

For the Sandhills work, AT&T worked also with what was then the Cherry County Soil and Water Conservation District (SWCD). AT&T and the district signed a contract wherein the district would furnish labor, machinery, and know-how to restore the grass cover on the right-of-way.



the Nebraska Sandhills

SCS, Lincoln, Nebraska

"We treated it like one long blowout, because we didn't want it to become one," said Willie Joe Holmes, SCS district conservationist at Valentine. Holmes estimated the scar over the trench would take 6 to 10 years to heal completely.

To date, Holmes estimates that about half of the right-of-way could be considered well reestablished in grass cover. The other half is in varying stages, some almost covered and short runs beginning to blow from no cover.

AT&T work through the Sandhills began in July 1968 when a trenching machine started the 100-mile trek, fol-

lowed by a crawler which laid the cable. Within minutes, a dozer blade replaced the soil.

Next workers from the Cherry County SWCD, using machinery purchased especially for the project, mulched the disturbed area with a minimum of 2 tons of straw per acre and punched it into the soil.

Two months later, they started three seed drills on their march down the line. Except where ranchers asked for something else, they planted the same kinds of grass that had grown there before. The mix included a pound of sand bluestem per acre, plus a half-

At far left, the AT&T transcontinental coaxial cable had just been laid in this section of the Nebraska Sandhills in 1968. Immediately afterward, workers from the then Cherry County Soil and Water Conservation District mulched the area and later seeded it to native grasses. At right, a photograph taken this spring shows the line going through the Jennings Bliss Ranch in Cherry County. Bliss does not mow the grass over the right-of-way so that it will produce seed.

pound of little bluestem, nine-tenths of a pound of switchgrass, three-tenths of a pound of sand lovegrass, and one-tenth of a pound of sand dropseed.

The mulch held the soil in place during the fall blow season and protected the seed until it germinated in the spring. The success of the planting then depended on the weather and the management that the ranchers gave the new seedlings.

To date, the progress has been slowed by extremely dry weather.

"I was born on this ranch 63 years ago, and I can't re-

member a dryer time," commented Kenneth Quible, a Sandhills rancher.

Most of the Sandhills got only 1½ inches of rain in June, normally the wettest month of the year for the area. The situation is still critical, both for beef production and for restoration of grass on the cable line.

Three of the 6 years since the cable went through have been among the driest on record. In the last 3 years, annual rainfall has been half the 20-inch normal for the area.

Additional problems have included the preference of cattle for grazing on the newly seeded grass and for rubbing off winter coats on the posts that mark the line. Extra work has been required to restore the holes the cattle stomp out around the posts.

The district has had to work hard on a few spots to keep ahead of possible blowing, according to Wesley Fox, who



The coaxial cable goes through 100 miles of the Nebraska Sandhills in five northern counties—Holt, Rock, Brown, Cherry, and Sheridan.

was chairman of the former Cherry County SWCD and is now a supervisor of the Middle Niobrara Natural Resources District (NRD) that replaced it in the reorganization of Nebraska's districts in 1972.

"We've had to add some machinery in order to keep up with the job," he said. The NRD works on an annually renewable contract with AT&T to keep up the restoration.

Gradually, the fragile land of the Sandhills is recovering, aided by good management by many ranchers.

"It's that way everywhere," said Willie Joe Holmes. "The ranchers who have traditionally done the best job of grassland management are getting it back on the line faster than normal." ♦

As the cable was put in, AT&T, SCS, and the Cherry County Soil and Water Conservation District worked together to restore vegetation. Checking the mulch as it was put down are Willie Joe Holmes, SCS district conservationist (left), Walter Carpenter, Cherry County SWCD manager, Dwight Beck, AT&T, and Wesley Fox, then chairman of the SWCD board of supervisors.



Texas Conservation Awards Program Cites 13 'State Champions'

A conservation district where landowners have built more than 4 million feet of parallel terraces . . . an absentee rancher who has given a standing invitation to the conservation district for tours, trial plantings, and new conservation procedures on his ranch . . . a teacher who helped develop a 228-acre outdoor learning center used by Fort Worth students.

These are among the 1975 winners in one of the largest state conservation awards programs in the country—the 30-year-old Texas Conservation Awards Program.

Under the leadership of the Fort Worth Chamber of Commerce, the Texas Conservation Awards Program is designed to encourage conservation on farms and ranches. Awards are presented in regions in the state as well as for the "state champions."

Twenty organizations sponsor the program, assisted by the Association of Texas Soil and Water Conservation Districts, the Texas State Soil and Water Conservation Board, and the Soil Conservation Service.

State champions received awards in 13 major categories at the annual program held in Fort Worth earlier this year.

The state champion district was the Hall-Childress Soil and Water Conservation District. Its accomplishments included constructing the Agriculture Building in Memphis, building of more than 4 million feet of parallel terraces by landowners in the district, sponsoring tours to show conservation practices, and promoting brush control. The use of cotton burrs as a mulch has also

proven a profitable practice in the district.

The state champion absentee conservation rancher was

Sparking a Study

by Orlin Lyng

District conservationist
SCS, Bismarck, North Dakota

A published soil survey, inadvertently left behind after a meeting, has resulted in a special study for a North Dakota class.

It all started when the Soil Conservation Service sponsored a meeting last February at the library of Sterling Public School to explain the newly published soil survey of Burleigh County to farmers in the area.

The one copy that was left behind ended up in the hands of teacher Frank Bell. He decided to work it into his class on North Dakota history.

Using the published survey, the students found their own farms and color-coded the soil capability classes and wrote a report on the soils of their own farms, including information on slope, drainage, and crop rotation possibilities.

In addition, the students discussed the soil survey information with their parents. They documented wet, clayey gumbo soils, which are problem spots for plowing, talked about cropping production potential of the various soils in the county, and discussed such questions as why some land is farmed and why other is left in grass. ♦

LeRoy Melcher, Sr., who owns the 1,800 Mel-Acres Ranches in the blacklands of the Washington Soil and Water Conservation District. In addition to planting more than 300 acres of grass, building more than 20 miles of new fences, and developing the water supply to 10 pastures, Melcher has given the district a standing invitation to try new conservation procedures at his ranch.

The conservation teacher award, to Ted Hofsis in the Dalworth Soil and Water Conservation District, noted that the outdoor learning center Hofsis helped establish involves students in conservation projects from building check dams to planting grass. Hofsis has also helped develop an environmental education handbook used by fifth graders.

Winner of the resident conservation rancher award was Ed Harrell of the Staked Plains Soil and Water Conservation District. When Harrell took over the 25,650-acre ranch he had grown up on, it had two pastures—a summer pasture and a winter pasture. His first action toward conservation was to cut his herd in half, to 500 mother cows. Then came fencing and developing water and brush control. After the severe drought of 1970, he reevaluated his plan and began a planned grazing system that included 9 miles of fencing, 22 miles of pipeline, and 23 water storage facilities.

Other state awards were to the outstanding wildlife conservationist, civic group, television station, radio station, newspaper, forestry conservationist, conservation homemaker, business / professional man, as well as for the winner of the essay contest, "Conservation—Key to the Future." ♦

From a Sand Hole To Lush Prairie in 34 Years

by Mary Ann Koch and Kenneth E. Noonan

Board member, Twin Platte Natural Resources District, and
district conservationist, SCS, North Platte, Nebraska



Viersen and author Noonan look over the Viersen ranch in Lincoln County, Nebraska.

Rangeland is a very important resource in Nebraska because the raising of livestock is a very important industry in the state. There are over 2 million range cows on ranches and farms in Nebraska which produce about 2 million calves each year.

According to information supplied by the Soil Conservation Service, Nebraska has the potential of an additional 4 million animal unit months of grazing per year if proper range management and range improvement practices were put into effect.

One family practicing planned grazing and range management for the past 34 years in the sandhills of Lincoln County is the Martin Viersens.

"We had a good crop of sand burrs and prairie dogs back in 1941 when we moved to Lincoln County," Viersen said.

"There was just a little house with no bath and a tumbled down sod house for a view," Mrs. Viersen added. "No trees around, but there were lots of tumbleweeds," she said.

"You couldn't look out of the house without seeing a sandhole and there was just one windmill on five sections

Reprinted with permission from the North Platte (Nebraska) Telegraph, March 20, 1975.

of land," Viersen recalled. "That mill pumped into a pond, there wasn't any tank.

"That first year we put down some wells, cross fenced, sowed rye on the farmland that shouldn't ever have been plowed up in the first place and planted some trees," Viersen said.

"At first we kept the livestock off the range that was in poor condition. Rotation, that was the main thing.

"Through the help of conservation people we experimented together and found a formula that worked. Good range management is more than improving plants and grasses and utilizing the forage on all the grazing units.

"There is a weather factor too. In a really dry year all your work can do down the drain in one season.

"Last year, the night before Memorial Day, we had a hard hail and 3 inches of rain. The ranch road washed out and some of the slopes washed away. Now they are blowing again for the first time in years.

"Three weeks after that hail we moved the stock onto pasture we had planned to save for fall. The fall pasture is gone and the cattle are in cornstalks. We'll bring them home soon now and put them out on the range and bunched hay. The calves will begin coming the last of March. The cows will pretty much take care of themselves but we will keep an eye on them.

"April is the toughest month. People need pasture for their livestock. What do you do if the grass doesn't grow?" Viersen asked.

A planned grazing system that works will: improve plant cover of desirable grasses while providing forage on all grazing units; improve efficiency of grazing by uniformly using all



parts of each grazing unit; insure a supply of forage throughout the grazing season; enhance the wildlife habitat and provide watershed protection, according to Soil Conservation Service specialists.

"We found out years ago we couldn't mow these hills every year and maintain good rangeland," Viersen said. "Now we have a 4 year rotation for mowing pastures to provide bunched hay."

In November, 1967, Viersen interseeded 282 acres of rangeland under a Great Plains Conservation Program (GPCP) contract. He used a special type of interseeder which applied a mixture of native grasses. These grasses included: sand blue-stem, indiangrass, little blue-stem, sand lovegrass, switchgrass, and prairie sand reed. He points out that now this rangeland is producing more forage than his native range areas.

The U.S. Department of Agriculture explains the plant physiology behind planned grazing as follows.

The Viersens started in 1941 with a little frame house with a tumbledown sod house for a view and lots of sand burrs in the yard.

Perennial plants initiate their growth in the spring from reserve foods manufactured by leaves the previous growing season. The foods are stored primarily in the root system. After the initiation of spring growth, there is a rapid depletion of the food reserves. New top growth begins to manufacture food when sufficient green growth has been produced.

Foods will then be manufactured as rapidly as they are used up by growth processes. More and more foods will be reproduced as the plant becomes larger, until there is an excess over growth requirements. After this point is reached, root reserves are slowly built up to carry the plant through the winter and initiate new growth the following spring.

When the plant leaves are removed at frequent intervals throughout the growing season, the plant is not permitted to store food in the roots. Instead, it is forced to draw further upon the reserve food already present. The plant must then enter the winter dormant season in a starved and weakened condition. This will severely handicap the plant in its ability to make the proper growth the following season. It will delay the plant in initiating spring growth and reduce plant vigor and forage production. If excessive removal of top growth is continued year after year, the desirable pasture range plants will be gradually eliminated by starvation and replaced by less desirable plants.

Some of the advantages of

planned grazing include improvement in plant vigor, increase in forage production and stocking rate, improved range condition, better livestock distribution and more even utilization of range resources, better utilization of all grasses since there is less chance of selectivity, thus more use of undesirable plants, reduced parasites and diseases, more stability in maintaining livestock numbers, better breeding in cow-calf program as livestock are concentrated in smaller areas, less travel to check livestock, water, salt, and fences, greater assurance for winter grazing, and blowout control in the sandhills.

Planned grazing systems will require more fences, more livestock watering facilities, and livestock and grasses may need more supervision, according to the USDA.

"Through planned grazing we have increased our cow herd more than 10 percent," Viersen said. "The calves we sold last October averaged 461 pounds. That's roughly a 2 pound gain per day and that is about what our calves have averaged since 1969."

There is always a constant problem in any range system between grass management and cattle management, according to the USDA. Anybody can be a grass manager by leaving the pasture idle. Anybody can be a cattle manager by overgrazing his pasture. It takes a good rancher to coordinate these two points of view.

Looking out across his rolling grassland, Viersen said: "There is a lot of satisfaction now in good range management. Maybe more than when cattle prices are good. In the end, this is all you have." ♦

Searching for Suitable Shrubs

by Kenneth Croeni and Larry McKibben

Manager, Lockeford Plant Materials Center
SCS, Lockeford, California, and associate wildlife manager-biologist,
California Department of Fish and Game, Gridley, California

Quailbush . . . four-wing saltbush . . . wolfberry . . . bladderpod.

These are the four shrubs which will be planted on a large scale in California this fall and next spring as a result of nearly 10 years of cooperative efforts between the Soil Conservation Service and the California Department of Fish and Game.

The two agencies, recognizing the need for improved food and cover plants for wildlife, started a search for suitable shrubs in 1966. Such plants, to be widely used, must be tolerant of a variety of soil and site conditions.

The first field evaluation plantings were made at SCS's former Pleasanton Plant Materials Center. These plants included shrubs native to California as well as plants domestic to other states and those introduced from foreign sources. To better determine their adaptation to California's climatic conditions, the shrubs received

no supplemental water following the year of establishment.

By 1970, 150 species and 250 accessions were under study. The original objective had been to provide improved food and cover for California quail, but it was immediately apparent that many other upland game birds and songbirds would benefit from such plantings.

A quail population was attracted to the 3½-acre field evaluation block at the center and numbered more than 200 by 1971. Observation of the quail habits aided in selection of preferred food and cover plants.

From this, plants indicating superiority were tested on California Department of Fish and Game property in the California coastal range, the Sacramento Valley, and the Sierra Nevada foothills.

The study was interrupted somewhat in 1972 when the plant materials center was relocated near Lockeford, California. The outstanding plants

were moved and the flow of new material into the evaluation process continues today.

The selection of new upland game food and cover plants is in the final stages. The four plants in the forefront—quailbush, fourwing saltbush, wolfberry, and bladderpod—have been propagated for large-scale plantings this fall and next spring by soil conservation district cooperators.

The shrubs will be available as seed, bare root plants, and as potted plants.

The use of fourwing saltbush will increase upland game, especially the quail population. The shrub is also one of the hardiest for establishment on roadbanks. It is native to the arid and semiarid regions of central and southern California, where much of the area re-

ceives fewer than 10 inches of rainfall. Cattle and sheep grazing on this highly palatable shrub eventually eliminated it from much of the foothill habitat.

Quailbush, as the name implies, is outstanding cover for quail, other upland game birds, and songbirds. Rabbits increase where plantings of this species have been established. Odd areas and hedgerows offer an excellent opportunity to plant this shrub, thereby benefiting wildlife. Quailbush can also be used on projects such as road fills and cuts, levees, and canal banks where the addition of food and cover is desirable.

Quailbush is native to central and southern California but is adapted to much of the land in the state below 2,000 feet,

especially in low rainfall areas. It should not be planned on soils of granitic origin.

Bladderpod is a good wildlife plant for upland game and also has a potential for shrub plantings along freeways and highways. It is a native desert type and very drought tolerant. Bladderpod occurs in much of the southern part of California, can be found to an elevation of 4,000 feet, and has been grown in much of the Mediterranean climate in the state.

Wolfberry produces a colorful, edible berry. It can be propagated easily from cuttings. Bare root, direct seeding, and potted material have also been used to establish this plant. Wolfberry is found in southern California, Arizona, New Mexico, Nevada, and Utah. ♦

The popularity of quailbush as a food and cover plant for quail is demonstrated by the grazing that quail have done around the shrub during field evaluation studies in California. The insert is of a valley quail.



SCS Workshop Sparks University Course on Outdoor Classrooms

by Jerry D. Schwien
Information specialist
SCS, Denver, Colorado

Nine outdoor classrooms are now underway in a Colorado school district, the direct result of a special course at Colorado State University (CSU) in Fort Collins last February.

The course, Horticulture #495, was designed specifically to give teachers from the Poudre R-1 School District in Fort Collins training to develop their school sites as outdoor classrooms. It was an outgrowth of a Soil Conservation Service workshop on outdoor classrooms held at Longmont, Colorado, according to Owen Smith, science coordinator for the R-1 school district.

Smith was among the teachers attending the 1-day workshop in August 1974. Fred McCullough, district conservationist, and Al Yoxall, soil conservationist, from the Fort Collins SCS office were among the SCS personnel attending.



Judy Gabler watches students at Beattie Elementary School in Fort Collins plant and water Russian-olive seedlings in an outdoor classroom.

"After that workshop," said Smith, "Fred, Al, Len Hadachek (also an SCS soil conservationist at Fort Collins), and I discussed what we might do to promote outdoor classrooms in Fort Collins. The CSU course was the result.

"We needed to give our teachers training as well as an incentive to get involved with outdoor classrooms."

The CSU class consisted of eight evening sessions of 3 hours each and several field

trips. The principal instructors were Smith and William G. Macksam who helped Smith develop the course outline. Dr. Macksam is a landscape architect and associate professor of horticulture at CSU. SCS personnel taught classes on native

range grasses, soils, and wild-life.

In addition to 29 teachers from eight schools in R-1 district, two teachers from Greeley and 12 teachers from Loveland, both nearby communities, also attended.

Each teacher was required to develop an outdoor classroom plan for his or her school site, with teachers from the same school coordinating their ideas. A critique and review of each plan were presented at the last formal class session.

In the spring, teachers began implementing their plans, most of which are designed to be carried out over a 5-year period. SCS is providing onsite assistance at each school, and in R-1 district, Owen Smith helps coordinate development.

Students at Beattie Elementary School in Fort Collins began their outdoor classroom May 1, when 300 Russian-olive plants arrived from the Colorado State Forest Service. Students planted these as a screen against traffic and noise along the west and northeast side of their 1/2-acre outdoor classroom.

All students at Beattie presented their ideas on what should be included in the outdoor classroom so they feel it is their classroom, according to teacher, Judy Gabler, who completed the CSU course.

The final plan was drawn by Barbara Haynie, a landscape designer in Fort Collins.

Mrs. Gabler is planning an orientation for other teachers at Beattie School to give them confidence in using the area.

Art teacher Garry Johnson is already confident. "Normally, it takes a year to teach a young student to draw a pine tree," he said. "We can do it much faster in the outdoor classroom where students can see and feel a real tree."

Johnson is equally enthusiastic about an irrigation system suggested by Len Hadachek of SCS who proposed diverting storm runoff from a nearby street drain and letting the water spread over the classroom area. Runoff about three times each summer will provide supplemental water for plants in the semiarid classroom.

The irrigation system will be a learning opportunity for city students who live along the front range of the Rockies where irrigation is a must.

The Beattie outdoor classroom also has community and parent involvement. One parent who owns property adjoining the school grounds has been using a portion of the open space for a garden. In exchange for continued use of the plot, he has agreed to take care of the plants in the out-

door classroom during the summer. Students will study his garden plants in the spring and fall.

Parents have donated equipment and labor and are planning fundraising events. A school carnival has already netted \$1,100 which will be used for the outdoor classroom and playground equipment. Garden clubs in Fort Collins and the owner of a local tree farm donated several large trees.

At Riffenburgh Elementary School, teacher Russ Fulton, another of the CSU enrollees, plans to develop an outdoor classroom along a section of a creek which flows through a city park adjoining the school. The school obtained written permission from the city to use the small, crescent-shaped area as an outdoor classroom.

Development will include placing fallen logs across the upper and lower ends of the outdoor classroom both to block motor bike traffic through the area and to create an area for studying tree rings; moving large rocks into the area for esthetics and identification; making a mud pan area with railroad ties to observe animal tracks; and transplanting adapted grasses, forbs, and woody species for identification and study. Russian-olive,



chokecherry, and native plum will be planted along the upper edges of the creek bank for screening and wildlife habitat, and one or two flicker nests will be moved from dead trees and placed in cottonwood trees on the site. An old, plugged tile drain will be augered out and loose rock placed over the end of the tile to simulate a freshwater spring for aquatic plants.

To encourage continued work on the outdoor classrooms in the eight R-1 schools as well as schools in the Loveland area, Fort Collins and Big Thompson Soil Conservation Districts are sponsoring outdoor classroom contests with an annual award to the school in each district that has done

the most in implementing its plan during the school year.

Science Coordinator Owen Smith gives SCS most of the credit for the increased interest in outdoor classrooms and the special CSU course, which is to be continued on an as-needed basis. The real stimulus for both, he feels, was the SCS-sponsored workshop held last fall in Longmont. ♦

Charlie Cecil, a sixth grader at Riffenburgh Elementary School in Fort Collins, checks water sample from the stream in the city park next to the school. Students are developing a section along the stream as an outdoor classroom.

Soil surveys

Florida

Lake County Area. By Albert L. Furman, Horace O. White, Orlando E. Cruz, Walter E. Russell, and Buster P. Thomas. 1975. Soil Conservation Service in cooperation with University of Florida Agricultural Experiment Stations. 83 pp., illus.; maps.

Georgia

Appling and Jeff Davis Counties. By Thomas A. Rigdon. 1975. Soil Conservation Service in cooperation with University of Georgia, College of Agriculture, Agricultural Experiment Stations. 65 pp., illus.; maps.

Mississippi

Yazoo County. By Frank T. Scott, Lloyd B. Walton, Earle E. Nail, and Vernon G. McGehee. 1975. Soil Conservation Service in cooperation with Mississippi Agricultural and Forestry Experiment Station. 51 pp., illus.; maps.

Nebraska

Jefferson County. By Robert S. Pollock and Lyle L. Davis. 1975. Soil Conservation Service in cooperation with University of Nebraska Conservation and Survey Division. 73 pp., illus.; maps.

New York

Herkimer County. By Arthur D. Kuhl, Allan B. Tallarico, Val J. Krawiecki, and William L. Shelton. 1975. Soil Conservation Service in cooperation with Cornell University Agricultural Experiment Station. 169 pp., illus.; maps.

Suffolk County. By John W. Warner, Jr., W. E. Hanna, R. J. Landry, J. P. Wulforst, J. A. Neeley, R. L. Holmes, and C. E. Rice. 1975. Soil Conservation Service in cooperation with Cornell University Agricultural Experiment Station. 101 pp., illus.; maps.

Texas

Dallam County. By Allan R. Ford and Richard W. Fox. 1975. Soil Conservation Service and Forest

Service in cooperation with Texas Agricultural Experiment Station. 47 pp., illus.; maps.

Utah

Cache Valley Area. By Austin J. Erickson and Vear L. Mortensen. 1974. Soil Conservation Service and Forest Service in cooperation with Utah Agricultural Experiment Station. 192 pp., illus.; maps.

Meetings

September

- 3-5** American Water Works Association (Chesapeake Section), Ocean City, Md.
- 8-12** International Association of Game Fish and Conservation Commissioners, Las Vegas, Nev.
- 8-13** American Fisheries Society, Las Vegas, Nev.
- 8-13** American Horticultural Society Congress, Honolulu, Hawaii
- 28-** National Association County Agricultural Agents,
- Oct. 2** Milwaukee, Wis.

October

- 2-3** American Forest Institute, Philadelphia, Pa.
- 4-8** American Bankers Association, New York, N.Y.
- 5-8** American Forestry Association, Washington, D.C.
- 5-9** National Association of State Department of Agriculture, Charleston, W. Va.
- 5-10** Water Pollution Control Federation, Miami Beach, Fla.
- 7-10** National Conference of Editorial Writers, Philadelphia, Pa.
- 14-17** Association of Engineering Geologists, Lake Tahoe, Calif.
- 15-18** National Council For Geographic Education, Toronto, Canada
- 19-23** National Recreation and Parks Association, Dallas, Tex.
- 19-24** SCS State Conservationists Annual Meeting, Mobile, Ala.
- 20-22** Geological Society of America, Salt Lake City, Utah
- 23-26** National Association of Biology Teachers, Inc., Portland, Oreg.
- 24-29** American Institute of Planners, San Antonio, Tex.
- 24-31** National Environmental Sanitation and Maintenance Educational Conference and Exposition, Clearwater, Fla.
- 27-**
- Nov. 1** Adult Education Association of the U.S.A., Salt Lake City, Utah
- 30-31** American Association For Vocational Instructional Materials, Columbia, Mo.

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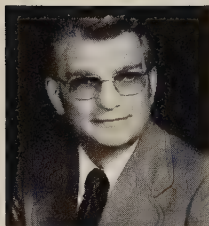
U. S. Department of Agriculture

Soil Conservation Service

October 1975



Farming To Save Fuel



Continuing petroleum shortages and higher prices will mean more changes in agriculture as farmers search for ways to conserve fuel while maintaining yields. Changes will include rapid increases in some farming

systems and virtual abandonment of others.

Minimum tillage, including no-till, is emerging as the most promising fuel saver for farmers. This practice has especially high potential for feed grains, cereals, soybeans, and cotton—the crops most in demand on the world market.

For example, one study shows that by switching from conventional tillage to slot-plant tillage for corn, a farmer can save 2.99 gallons of diesel fuel per acre. This figure includes all energy input, even that used to build the tillage equipment. USDA predicts that by the year 2000, minimum tillage could account for annual fuel savings of 850 million gallons in machinery operations.

Minimum tillage has other advantages too. It makes double-cropping or multicropping feasible in more parts of the country. It also cuts soil losses from water erosion and soil blowing and makes it possible to farm land with soil too erodible for conventional tillage.

Another energy saver is better management of irrigation water. SCS estimates that by

increasing the efficiency of both delivery systems and on-farm irrigation, farmers could save more than 230 million gallons of fuel each year. The energy savings would vary with the type of irrigation system and from state to state, but the potential seems to be great. For example, a Nebraska study estimates that through more precise scheduling of sprinkler irrigation, \$7.1 million of energy cost could be saved annually in that state alone, based on 1974 energy prices.

Although we can save a substantial amount of petroleum using the knowledge we have now, USDA and private groups are researching ways to save even more. Some experimenters are planting crops by air to eliminate all cultivation, for instance.

And USDA is researching energy sources other than petroleum for agricultural use. In two such projects, scientists are studying solar energy for drying crops and livestock wastes.

Districts need to be aware of continuing research on new energy-saving practices for farmers as well as those in use now. They must also be aware of the drawbacks involved. For example, we still do not know the long-term environmental effects of many herbicides and insecticides used with minimum tillage.

By keeping informed of current developments in agriculture, SCS and district people can help farmers use fuel more efficiently without cutting into their production.

A handwritten signature in dark ink, appearing to read "J. R. M. Davis". The signature is fluid and cursive, with a large, stylized "J" and "D".

October 1975, Vol. 41, No. 3

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Earl L. Butz
 Secretary of Agriculture

R. M. Davis, Administrator
 Soil Conservation Service

Prepared in the Division of Information,
 Soil Conservation Service,
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Contents

- 2 From the Administrator
- 4 Taming the Tamarac River
Thomas C. Gahm
- 6 The Meaning of L.I.F.E.
Gene Warren
- 8 Revegetating Mine Spoils in a Desert Shrubland
Arnold Nowotny and Bill Wood
- 10 A New Commission for Missouri's Betty Broemmelsiek
Kent Alverson
- 12 Soil Surveying the Nation's Capital
Anne Zack
- 16 'The Way a Stream Should Be'
Jim Bilyeu
- 19 South Dakota Conservation District Sets Up 'Drive It Yourself' Tour
Joyce Watkins
- 20 Prime Lands Seminar Makes Recommendations to USDA
R. Neil Sampson
- 22 Recon . . .
- 22 Soil Surveys
- 23 Meetings

COVER: SCS Soil Scientists Horace Smith and Ed White at work, finishing up the first all-urban soil survey in Washington, D.C. (see story on page 12).

Taming the Tamarac River

by Thomas C. Gahm

Information specialist, SCS, St. Paul, Minnesota

It rose out of a bog in northern Marshall County and—depending on the season—trickled or raged its way for 40 miles over the fertile valley farmland into the Red River of the North.

In spring or after a heavy summer rain it would jump its banks and spill onto miles and miles of cropland. In the fall of a dry year its force would dwindle, and it would betray the town of Stephen which depended on it for municipal water. Too often the unsloping farmland within the watershed would be covered with water for too long, and crops would be lost to rot or disease.

That was Tamarac River a decade ago.

Today the story is different because the people of Marshall County decided to do something about it. Their land was some of the richest in the country, and they knew it could be even better.

They launched a watershed protection and flood prevention program, assisted by the Soil Conservation Service, on the quarter-million-acre Tamarac River watershed. That project is underway today. Although only partially completed, the project withstood its first severe test—and possibly the most strenuous it will ever face

—early this summer. The 8 inches of rain that fell on July 1 have resulted in much of the Red River Valley being declared a disaster area, but damage was noticeably less where the dams, channeling, river bank improvement, and soil conservation practices of the Tamarac River Watershed Project were in place.

Hilary Kuznia, who farms 450 acres near Florian, figures he lost 15 percent of his crop yield because of the heavy rain this year. The Tamarac River and one of the project's four branch channels go through his farm. Kuznia believes that without that channel his loss would have been more like 50 percent.

"Without that ditch the water wouldn't have gone off the fields for 48 to 72 hours," he said. "That channel took the water off in 24 hours and the crops survived."

Getting excess water off the fields is one of the main problems the Red River Valley farmer faces. Natural drainage is minimal because the land is as flat as a table top, and tile drainage is virtually impossible because of the heavy soils of the area.

This water management problem is the primary one the Tamarac River Watershed Project is tackling. The project

calls for 40 miles of channeling. Except for 2 miles of new channeling, this will consist of improving existing channels. The four branch channels move excess water from fields into the Tamarac, and about 8 miles of the Tamarac's main channel are being widened to double the capacity of the river.

As the channels are completed, banks are seeded and inlets are designed to control soil erosion and keep the channels free of sediment and other debris.

Most of the main channel work on the Tamarac has been finished.

"Guys along the Tamarac didn't lose enough to cry this year, when previously they would have lost it all," says Lawrence Kuznia, who farms 5 miles northeast of Stephen. "Areas that flooded in past years, when water levels were lower than this year, weren't flooded this year," said the cousin of Hilary Kuznia.

An ardent supporter of the watershed project, Lawrence Kuznia believes that Marshall County is one of the richest in the valley—and getting richer. "We're draining so much of the county that was never in production before. Good farming is a reality where it never was before."

Kuznia farms 4,360 acres and

says that 1,100 of them have suffered from crop disease because water did not move off them fast enough. Much of his land is along a yet uncompleted branch channel.

"This branch just has to go in to save us all," he says.

More obvious than the channels are the two dams of the Tamarac River Watershed Project. These are designed for several functions, including holding back floodwater and creating bodies of water for human and wildlife use.

The East Park Flood Control and Wildlife Management Area is located at the headwaters of the Tamarac about 6 miles east of Stranquist, and was the first part of the watershed project completed. Water from 44,000 acres is held behind the dam and released as needed. The dam can store 4,520 feet of floodwater, and in so doing, creates waterfowl habitat and a popular hunting area in the marshy area behind the dam.

Two weeks after the big rain-storm, water was being released through the dam still a couple feet higher than normal. Hilary Kuznia, 18 miles west of the dam, believes that he would have been flooded had the East Park Dam not been there to hold the water back.

While the dam keeps unwanted water off the farms below it during the wet season, its capacity is such that it stores water for the town of Stephen during the drier times. The water it holds is assurance that the community will have a sufficient year-round water supply.

"Three years ago, it was very dry and we almost lost our water supply," recalls Mayor Lawrence Sunsdahl. "But last year, because of the water backed up behind the dam, the river flowed full all fall, and the town's reservoir was full all winter.

"The town's main concern is about the water supply aspects

of this project, although flood control is more important to us than we realized it would be."

Sunsdahl said the widened Tamarac channel going west out of Stephen saved the town from flood damage this year because it moved the water out faster, rather than allowing it to back up into the town.

Downstream from the East Park Dam and Wildlife Management Area, the new Overton Dam straddles the Tamarac. Its most obvious function when completed will be the creation of an 80-acre lake. A lake is about as rare as a hill in this part of the country, and people have already planned a variety of public recreational uses.

Known as Florian Flood Control and Recreation Area, this part of the project will result in a county park with campsites, a swimming beach, and a boat landing.

The lake will be more than 20 feet deep in spots and will



Water runs over the East Park Dam at the headwaters of the Tamarac 2 weeks after the July 1 flood. The dam protects the cropland below and provides habitat for wildlife.

be full by next spring—or by this fall if there is much rain.

Stephen, Marshall County, and the Marshall Soil and Water Conservation District are sharing costs of the nearly \$3 million watershed project with the federal government. SCS is providing more than \$2 million in financial assistance and technical help to the local sponsors and landowners.

Everyone in the watershed is being assessed by the county for the improvement works. Mayor Sundahl says Stephen will pay \$1,000 a year for 10 years. Farmers are assessed according to the benefit they will receive. Hilary Kuznia, for example, pays \$130 a year for 10 years on his 450 acres.

"The way I look at the assessment," he says, "is that it benefits the community as a whole."

Dennis Pate, SCS district conservationist at Warren, says there is good support for the project among farmers of the area as evidenced by the fact that 65 percent of the farmers in the Tamarac watershed are signed up as cooperators with the Marshall Soil and Water Conservation District. About 25 percent of the county as a whole is signed up with the conservation district.

All the farmers along the main channel are operating their land with conservation plans, according to Pate.

"Farmers who are signed up as cooperators and practicing conservation, such as windbreaks and minimum tillage, are actually helping assure the longevity of the watershed project," he says. "By controlling soil erosion in the uplands of the watershed, they are keeping silt and sediment out of the channels and the Tamarac itself."

Harry M. Major, SCS state

conservationist, says that the practice of soil conservation by farmers is really the main part of a watershed project in the eyes of the SCS.

"A watershed project is actually planning good resource management and conservation for the whole watershed," Major said. "The more landowners who are cooperating in the conservation effort, the

better the watershed project will be."

The Tamarac River Watershed Project, which includes part of Roseau and Kittson Counties, in addition to Marshall, is one of eight currently under operation in Minnesota by SCS under PL-566, the Small Watershed Protection and Flood Prevention Act.

Another seven projects have already been completed. ♦

The Meaning of L.I.F.E.

by Gene Warren

Information officer, SCS, Alexandria, Louisiana

Walk up to most folks in Franklin Parish, Louisiana, and say, "What's LIFE?" and chances are they won't say "breathing in and out"; the answer most often is, "Let's Improve Franklin's Environment." Individual groups and total communities in Franklin Parish are so involved in improving the environment that you almost get a fine for not displaying a LIFE bumper sticker.

It all began in 1972 when the Northeast Soil and Water Conservation District conceived the idea for the Parish project. Mayors, the police jury (commission / court), civic groups, and just about everybody old enough to hold a broom liked the idea and LIFE was born.

Franklin Parish was in need of a facelifting—most parish people agreed on that. Old cars were stacked everywhere . . . litter lined many roads . . . drainage was poor . . . towns needed sprucing up.

After more than 100 meetings with groups, proclamations by mayors, cleanup days, LIFE parades, and a

long list of other action-prompting events LIFE has, indeed, come to life.

"I've never seen anything like it," Northeast District Supervisor Allen Cruce said. "Once we got the project going local people flocked like bees to help. Just goes to show you that people really are concerned about their environment."

LIFE benefits are now flowing in Franklin Parish—most of the junk cars have been hauled away, plantings have been made along roads and in downtown areas, including more than 1,000 crapemyrtles and 10,000 pine seedlings, and the parish police jury now has plans for a parish waste disposal system.

A new nine-member LIFE junior board has been formed and is working to involve parish youth in conservation projects.

District Chairman Kirby Tillotson says the sky is the limit when it comes to cooperation. "I believe our people will get behind us on any project that will improve the environment." ♦

Erosion and Sediment Control Guides Published in More Than 13 States

Because of the growing concern about sediment pollution many state offices of the Soil Conservation Service as well as state agencies are publishing guides for controlling erosion and sediment on construction sites.

These guides contain descriptions of various erosion control measures and how-to information for establishing vegetation and designing and installing structures. They may be used by property owners, land developers, city planners, engineers, and county and state officials in connection with sedimentation control laws recently passed by many states. They are also used as manuals by municipal and county governments in enacting sediment control ordinances.

Among the first was the *Guide for Sediment Control on Construction Sites in North Carolina*, published in 1973, and now in its third printing. When the North Carolina Sedimentation Control Commission was established, it adopted the guide as its operations manual. More than 7,000 copies of the 220-page book have been printed.

One of the most recent publications is *Guidelines for Soil and Water Conservation in Urbanizing Areas in Massachusetts*, released in April. William P. Annable, SCS assistant state conservation engineer, said the guide is designed to help create an awareness of the problems of erosion and sediment control and water management as well as showing how these problems can be handled.

Other states with published sediment guides include Con-

necticut, Hawaii, Indiana, Maryland, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, Virginia, West Virginia, and Wisconsin.

Oregon Cooperators Named Farm Family Of the Year

"City people who returned to the land and made outstanding progress as farmers" is the way Secretary of Agriculture Earl L. Butz described James and Patricia Ottoman when they were selected as the Farmers Home Administration National Farm Family of the Year.

Cooperators with the Klamath Soil and Water Conservation District in Oregon, the Ottomans note their firm belief that land should be improved for future generations. Each year, they put aside funds in their operating budget for soil and water improvements.

When they bought their farm, it was a 40-acre clover field with no improvements, many ditches, and a high water table—but with excellent loamy soil. Over the years they have transformed the open field into a productive farm and gradually improved and increased their farmland holdings. They have installed an irrigation system and laid tile drains.

Reared in the city of Klamath Falls, the Ottomans have learned to use good farm practices along with soil and water improvements to increase the productivity of their farm. Their largest crop is potatoes, with 115 acres yielding 380 sacks per acre. They also raise alfalfa and barley. ♦

Bicentennial Park

A previously unused lot is now the "Northridge Bicentennial Park" in Bismarck, North Dakota, thanks to work by students and by personnel from the city, school, and Soil Conservation Service.

Thirty second-grade students at Northridge Elementary School planted red-osier dogwood shrubs during dedication ceremonies in May. Before the school year was over, they had also planted Russian-olive trees.

During the 5 years expected to complete the park project, students will be planting more than 40 species of trees and shrubs, including newly released plants for conservation from the SCS plant materials center in Bismarck.

The idea for the park began with Mrs. W. F. McClelland and her second-grade class. Mrs. McClelland contacted Orlin Lyng, SCS district conservationist, for assistance in developing the 90- by 292-foot lot into an outdoor classroom. SCS state forester Elmer R. Umland worked with Mrs. McClelland to help select trees and a design for the park. The South Burleigh Soil Conservation District and the Lincoln-Oaks Nursery, operated by the North Dakota Association of Soil Conservation Districts, provided trees and shrubs for the initial plantings. ♦

Revegetating Mine Spoils In a Desert Shrubland

by Arnold Nowotny and Bill Wood
State conservation agronomist,
SCS, Phoenix, Arizona, and
district conservationist,
SCS, Casa Grande, Arizona



ASARCO Photo

A drip irrigation system helps establish native plants in the desert shrubland of the Sacaton Mine Unit. Emitters drip about a gallon of water an hour at the base of the plants.

Revegetating mine spoils can be quite a challenge, especially when the mine site is in an arid climate with 8-inch rainfall and the natural vegetation is desert shrub.

In central Arizona, ASARCO Incorporated included revegetation of mine spoils in the overall mining plan for its new Sacaton Mine Unit near Casa Grande. Revegetation began as soon as the plant was constructed in 1973.

Officials of the open pit copper mine became cooperators with the West Pinal Natural Resource Conservation District and sought help in the conservation treatment of their mine spoils from the Soil Conservation Service.

Plans were made to revegetate three types of mine spoils: rock overburden and soil ma-

terial removed from the open pit mine and tailing material removed from the processing mill.

Several factors were considered in planning the revegetation program. These included the arid climate, the alkali soils, and the total lack of organic matter in the mine spoils. Other important factors considered were the steepness and length of the slopes, which created a severe erosion problem, and the loose, uncompacted construction of the slopes, which caused a drainage problem.

Because of these factors, the conservation plan developed by ASARCO included the installation of a drip irrigation system and the planting of native shrubs and trees.

Native species planted in-

clude mesquite, palo verde, bursage, desert broom, salt-bush, hopseed bush, and brittle bush. They were selected because of their adaptability to the local environment, fast growth, color, and harmony with the surrounding desert flora.

The revegetation program went into action in January 1974, under the direction of Stuart Bengson, ASARCO agronomist.

The first areas to be revegetated were the water tank hill and parking lot, which were built with the soil material removed from the open pit mine.

Later, some disposal areas of rock overburden were revegetated. These areas were first "capped" with 6 to 8 feet of soil material which had been hauled from the construction

and open pit areas and stockpiled specifically for this purpose. This same procedure will be used to revegetate all the disposal areas constructed, including tailing material.

Gallon-size nursery stock was used to revegetate the slopes. Approximately 2,300 plants were planted on an approximate 10 X 15 foot spacing pattern.

Trees and taller shrubs were planted along the top and bottom edges of the slope to break the smooth, flat visual impact of the edge. Lower-growing shrubs were used to cover and stabilize the slope faces.

The drip irrigation system was then used to help establish the trees and shrubs. The system is designed to emit water at each plant, is portable and especially adapted for use in arid environments. Its primary advantage is the conservation of water. In addition, it is adaptable to remote areas because of its low flow volume and low pressure requirements.

The system consists of flexible tubes of polyethylene with a series of fittings called emitters spaced about 10 feet apart. The emitters slowly drip about a gallon of water an hour at the base of the plants. At this slow rate of application, the danger of water runoff and resulting erosion is virtually eliminated. Another advantage of the system is that the fertilizer is applied to the plants through a drip system filter and fertilizer injector.

When the drip irrigation system was installed, the plants were irrigated twice a week for 8 hours at a time. Now, the plants are irrigated only once a week for 8 hours. Bengson hopes that by this fall the system can be removed and the plants will survive on the natural rainfall.



ASARCO Photo



This year the revegetation program has expanded to include a variety of planting methods, such as hydroseeding and mulching. Planting trees and shrubs is still the predominant method of revegetation. Eventually, all the mine spoils will be capped with soil material, revegetated, and temporarily irrigated.

The ASARCO revegetation program for the Sacaton Mine Unit has shown remarkable progress and success. In a year's time, the plants established on the water tank hill and parking lot are more than three times their original size.

In time, the open areas between the trees and shrubs

The water tank hill was one of the first areas to be revegetated in January 1974 (top photo). A year later, the plants showed substantial progress. The drip irrigation system will be removed once the plants are well established and the native species will then survive on the natural rainfall.

should fill in with annual plants as seed is blown in from the surrounding desert and trapped by the shrubs.

ASARCO's work to stabilize and beautify the mine spoils at the Sacaton Mine Unit, and also the Mission and Silver Bell Mine Units, will help restore the areas to a more natural landscape when the mines are eventually closed. ♦

A New Commission For Missouri's Betty Broemmelsiek

by **Kent Alverson**
Former Head,* Information Unit,
Midwest Technical Service Center,
SCS, Lincoln, Nebraska



Betty Broemmelsiek, chairman of the Missouri State Soil and Water Districts Commission, checks the beef herd on the 550-acre family farm near Defiance.

Betty Broemmelsiek was out in the field mowing hay when she got a telephone call asking her to be a supervisor on the St. Charles County (Missouri) Soil and Water Conservation District Board. That was in July, 1967.

Today, Betty Broemmelsiek is still making hay—on the farm and in the administration of Missouri's conservation programs. She's now the chairman of the new Missouri Soil and Water Districts Commission—the first woman in the country to hold such a post.

She has come up steadily in responsibility in the state, starting as a district cooperator with her husband Jack in 1961, becoming the first woman in Missouri to be named conservation district supervisor in 1967, and now heading the Commission, which was formed in January in a reorganization of state government.

The Commission is in the Division of Environmental Quality in the State Department of Natural Resources. Formerly, a similar committee had reported directly to the Governor.

Through the years, Betty Broemmelsiek has refined a list of eight goals she feels to be the "big job ahead" for conservation districts, and as state commission chairman, she's working to help—

- increase food production without damage to the land
- protect prime agricultural land
- increase district authorities and capabilities in sediment and nonpoint pollution control
- enlarge the role of the district in flood plain management
- accelerate land inventories, soil surveys, and land use planning
- improve the management of forest lands

—employ more technical and administrative personnel with local and state funds

—strengthen the reputation of districts as responsible, capable conservationists.

Encouraged by much that has gone on in the state, she and her fellow commission members are acutely aware that two-thirds of the land in Missouri still lacks adequate conservation treatment. She's hopeful they can get additional state funding to do the job and also encourages districts to draw more people into volunteer conservation work.

One of the untapped natural resources to do this job are women, she notes.

"Many a Missouri woman has fought for the land, helped clear it and populate it. They are naturals for the job. Forty percent of the land is owned by women and they control the rest, so let's put them to work to conserve it."

* Mr. Alverson retired in June 1975.

Before her four children graduated from home, Mrs. Broemmelsiek found erosion problems on the family's 550 rolling acres about all she could think about. Now she finds the days "unbelievably long" and has time to help others with conservation problems.

St. Charles, her home district, is an urban-oriented county just across the Missouri River from St. Louis. Positioned at the confluence of the Missouri and Mississippi Rivers, it faces continual challenges of flood-

ing, erosion, and other soil and water problems. People problems mingle with the natural resource problems. There is competition for the available land for home building, industry, farming, truck gardening, and all manner of farm and city enterprises.

Living and working in such an area can be a rich educational experience. Mrs. Broemmelsiek and her coworkers are not missing the opportunity.

"To dramatize the problems that come from being bordered

by the two greatest rivers in the country, we are using a new film called 'Planning for Floods,'" she said. "It was filmed in St. Charles County by the Environmental Defense Fund with our own district conservationist, Les Volmert, as one of the stars.

"Another educational service we're offering is farm tours for children. We have found that if boys and girls don't live on a farm, even though there is one a mile away, they know very little about what is going on."

In addition, she's recently prepared a slide-tape presentation on St. Charles County for schoolchildren. The show includes the geologic origin and history of the county as well as its agriculture and conservation practices.

Probably the most widely known activity in the St. Charles Soil and Water Conservation District is the annual "Fish for Fun" contest held in April.

This benefit program usually nets \$2,000 for the district. About 20 ponds are opened to the public, with the pond owner collecting \$1 per fisherman for the district.

"The publicity for 'Fish for Fun' involves all of us," Mrs. Broemmelsiek said. Some 20,000 flyers are circulated and local papers and broadcast media are contacted.

The district's annual dinner meeting is another popular and widely attended event.

"This is where we hope education catches fire and turns into action," Mrs. Broemmelsiek said. "We try to have an interesting, fast-moving program. We hope that each farm family will be inspired to plan and carry out one new conservation practice in the next year." ♦



"Fish for Fun" is a project that nets both fish for the fishermen and income for the St. Charles County Soil and Water Conservation District for the promotion of conservation.

Soil Surveying

The Nation's Capital

by Anne Zack
Information Division, SCS, Washington, D.C.

The first all-urban detailed soil survey is nearing completion in Washington, D.C., and will be published during the Bicentennial.

It is being conducted by a Soil Conservation Service team headed by Horace Smith, a soil scientist at the Maryland state office. The National Park Service, which manages one-fourth of the land in the District of Columbia, is sharing the cost of the survey, and the Washington Technical Institute, D.C. Department of Environmental Services, U.S. Geological Survey, and University of Maryland are cooperating with SCS on the project.

Although SCS has mapped urban areas since 1966, the D.C. soil survey will be the first published survey geared entirely to the urban resident. Unlike most other surveys, it will feature sections on landscaping, pollution-tolerant plants, home gardens, and grasses for lawns. Of historic interest will be maps made by

Pierre Charles L'Enfant, planner of the Capital City.

The need for soil surveys of urban areas is evidenced by the demand for soils information in Washington. Officials at the D.C. Office of Environmental Planning have found the detailed soil map so useful that they are putting together completed sections of the map as a base for decisions in land use planning now, without waiting for the survey to be published.

The completed soil survey will cover all 44,160 acres of the District and will provide a wealth of information for land use planning. For instance, it will point out soils that have wetness, slippage, and erosion problems as well as soils that offer good construction sites.

For example, the southeastern part of Washington is on the Coastal Plain. Because of its texture, much of the soil in this area tends to slide downhill when it is saturated. Erosion and the activities of construction hasten the slipping.



With sightseers in the ba

During the heavy rainfall from Hurricane Agnes in 1972, one man's backyard slid downhill. The "O Street Slide," as it is called, still blocks one entire lane of the street.

At an apartment building in the same area, half an asphalt parking lot followed the soil downhill, leaving an abrupt drop. The building owner erected a chain link fence to keep people from driving off the edge at night.

Unlike the Southeast, northwest Washington is in the Piedmont geologic province where erosion and landslides



Background, SCS Soil Scientists Ed White and Horace Smith take soil samples near the Lincoln Memorial.

are generally not severe problems. However, many streams and underground springs have been filled and covered by construction. Homeowners in the northwest — and engineers building a new subway—are occasionally confronted with structural damage caused by the springs, seepage, and drainage problems.

If the survey had been done years ago, it would have helped solve many Park Service problems, according to James C. Patterson, a research agronomist there.

For example, the Japanese

cherry trees that line the Tidal Basin around the Jefferson Memorial are beautiful and the setting is picturesque, but the Park Service has trouble keeping the trees in good condition. Many of the original trees have been replaced. A soil survey would have shown that the water table there is too high for the trees, and other sites, or modification of the existing site, could have been considered for the gift from Japan.

In West Potomac Park, near the Washington Monument and the Lincoln Memorial, the Park Service couldn't get grass to

grow. It reseeded the area several times with little success. One of his first assignments, Patterson called for a soil test and conducted a greenhouse experiment. The results showed the soil was extremely acid, with a pH of 2.6. The Park Service had to either remove and replace the soil or use a road grader to mix 80 tons of lime per acre—more than Patterson had ever heard of using—with 12 inches of soil to establish the grass.

A soil survey would have flagged the acid soil in that area, and the Park Service



Smith maps soils near the Prince George's County, Maryland, line.

could have considered excavating the soil and bringing in topsoil from other sources.

The Park Service, in construction of the Bicentennial park, Constitution Gardens, rebuilt more than 42 acres of soil by mixing Beltsville compost—a mixture of wood chips and sewage sludge—and leaf mold with existing urban soil. The project cost more than \$200,000, but alternatives would have cost nearly \$500,000.

One reason the Park Service was able to build Constitution Gardens economically was that it did not have to purchase large quantities of topsoil. Patterson investigated the site and discovered some topsoil available for the rebuilding project at one end of the area. A soil survey would have shown the source of topsoil and Patterson's search would not have been necessary.

The Park Service, like the

D.C. government, has already borrowed completed map sheets and uses them for studies of erosion along streams. The finished survey will also provide the Park Service with needed information on managing soils for ornamental plants, shade trees, flowers, and woodland.

The momentum for a D.C. soil survey began almost 7 years ago when students at an elementary school discovered they needed soil survey information to plan a 5-year ecology project for their school grounds. They contacted the SCS state office in Maryland, which has responsibility for the District. Ernest L. Moody, who is now SCS district conservationist for Washington, D.C., provided the necessary information and helped with the project.

After that, parents involved in the project requested soil surveys of their own property. Interest in a District-wide survey spread from these parents to local civic groups.

The Citizens Council for a Clean Potomac was among the groups which wrote letters to the District government and USDA requesting the survey. The council plans to use the survey in campaigns to reduce sedimentation and pollution throughout the Potomac River basin.

The soil survey will point out areas that are likely to erode and pour sediment into the Anacostia River as well as the Potomac.

Although SCS makes soil surveys mainly of agricultural land, it is making more and more urban surveys as city officials and urban residents, such as the ones in Washington, D.C., demand information about their soils to use in improving their environment. ♦

Among the soil problems in the Nation's Capital is slippage in the southeast, such as in the apartment parking lot at right. Below, SCS Soil Scientists Smith and Linton Wright, Jr., map in the heat and humidity of a Washington summer. At far right, White and Smith map in Lafayette Square in front of the White House.



8/12



'The Way A Stream Should Be'

by Jim Bilyeu
Information officer,
SCS, Nashville, Tennessee

A biological marvel is quietly taking place in streams in the northwestern corner of Tennessee.

The area involved is in the Thompson Creek Watershed, authorized in 1958 as one of the first Public Law 566 watershed projects in Tennessee.

A team of university biologists have found that water quality in the streams and branches of the watershed has been substantially improved, turbidity has been drastically reduced, and oxygen content is almost at the saturation point—to the extent that the streams now support a growing array of valuable species of aquatic plant and animal life.

Dr. Ted James, chairman of the Department of Biological Science at the University of Tennessee at Martin, and a team of biologists made extensive samplings for stream habitat assessment and water quality studies during the summer of 1973 under a contract from the Midwest Research Institute of Kansas City, Missouri. The study, for an environmental impact statement for the U.S. Army Corps of Engineers, extended to the Obion River sys-

Jimmy Spencer, district conservationist in the Weakley Soil Conservation District, looks at rock riprap in Capps Branch.



tem and included Reelfoot Lake and its tributaries.

Thompson Creek is a tributary of the Middle Fork of the Obion River and lies in Weakley and Henry Counties. Dr. James' group chose Capps Branch, a tributary of Thompson Creek, as one of the streams to study because of its accessibility and also because it had been man-altered during development of the Thompson Creek Watershed Project by the Soil Conservation Service.

"We were in Thompson Creek checking for the presence of invertebrates, and what we found was pretty impressive," said Dr. James. "The lack of turbidity was the first thing that struck me. Thompson Creek is like a stream one would expect to find where there is no active agriculture. The water was clear and running fast," Dr. James said, "... It's the way a stream should be. But I expect that's a reflection of the effectiveness of some of the watershed project's conservation measures."

The biologists were particularly excited about finding clams and attached algae in the streams. "The clams are small, but they're in there," Dr. James said. "And that's the kind of animal that silt will cover up. They simply can't

survive in a stream that's carrying a heavy silt load. If you consider that an animal like a clam is a filter feeder and must circulate water through its body to filter food out of it, then its presence is a pretty good indication that the water quality is high."

The presence of attached algae—which the researchers found in the channels—is almost required for any stream to be productive, according to Dr. James. "We found dragonflies, caddisflies—the sort of insects that are at the base of a lot of food chains; and that's probably why a lot of fish like to gather along that stretch of the channel," Dr. James continued. "From that standpoint, based on that one observation, the streams in the upper portions of the watershed are considerably different than they are farther downstream. They are also in much, much better shape from a biological standpoint because, at least in the streams where we were taking samples, there was not as much siltation, whereas the main channel of the Obion-Forked River virtually cannot support these kinds of fauna.

"Any time we got out of the fairly small streams into the main channel, say the Middle or North Fork of Obion, the number of invertebrates went

down—way down—and diversity went way down, too," Dr. James said. "There's an indication that the small feeder streams are the ones that are productive. The main channel itself is not."

Dr. James E. Deck, assistant professor of biological science at Martin and also a member of the study team, made some equally impressive finds in his study of fish fauna in Thompson Creek and Old Town Creek. The fish collections were made after work on Thompson Creek was completed and before much work on Old Town Creek was begun.

In his report Dr. Deck listed approximately 50 species known to exist in the two creeks. In the two watersheds probably fewer than 10 additional species occur that have not been collected, according to Dr. Deck's report. Since the total number of species found in the Obion-Reelfoot system is slightly more than 100, the fish fauna of these two watersheds is quite diverse. The fauna is generally typical of the upper parts of the Obion River.

The species composition is of fish that generally require moderate water current with little siltation and little turbidity. Casual observation suggests that the invertebrate popula-

tion may be rather large and diverse compared to more downstream areas. These invertebrates would help to explain the diversity of fish since several invertebrate feeders are found in reasonable abundance. Several species of fish with broad tolerances occur in these two watersheds as they do in many others, including more downstream and disturbed areas.

But the streams and branches haven't always been so clean and productive, according to Herman L. Hearn, a lifelong resident of the Ore Springs community and a director in the Thompson Creek Watershed District.

"Years ago, before the project was started, Thompson Creek just spread out all over the bottoms. It was so full of sediment that it dried up during part of the year," Hearn said. "By the time the project started, there just weren't many fish in the creek, mostly just bullfrogs."

The Thompson Creek Watershed Project, authorized in 1958, included plans for five small dams at key locations within the 18,700-acre project area to trap floodwaters and sediment in the upper portions of the watershed. Provisions were also made for channel modification to include enlargement and sediment removal with some realignment on about 13 miles of the creek. Generally, bottom widths vary from about 20 feet, where Thompson Creek empties into the North Fork Obion River, to some 4 feet in the upper reaches of small sidestreams.

Before work on the dams and other construction activities could begin, a comprehensive land treatment program had to be carried out by the Weakley County Soil Conservation Dis-

trict and the Thompson Creek Watershed District. The work included reforestation more than 2,000 acres of severely eroding land. About 5,000 acres of pastureland were seeded to help hold the soil in place. Other work included the installation of thousands of acres of conservation farming systems including waterways, rotations, and contour cultivation.

At about the time the land treatment work began, the Tennessee Wildlife Resources Agency (then, Tennessee Game and Fish Commission) released 93 white-tailed deer—40 bucks and 53 doe. These were the nucleus of a flourishing herd that yields a bumper crop for deer hunters each year. During the 3-week deer season in 1973, more than 300 deer were taken by hunters and counted at checking stations operated by officers of the Tennessee Wildlife Resources Agency.

Today, some 16 years after the land treatment phase of the Thompson Creek project began, groves of loblolly pine trees hold the once erosive gullied areas in place under a thick canopy of branches and blanket of pine needles. Cattle graze on pastureland that was once eroding idle fields. Wildlife plantings support a wide variety of upland game. The lakes, which were built after the land treatment was installed, offer a resting place for a variety of waterfowl. The largest of the five lakes, 183-acre Garrett Lake, was designed to be used for flood prevention, recreation, and fishing through a cooperative arrangement between the Soil Conservation Service and the Tennessee Wildlife Resources Agency.

The lake traps storm water and sediment from more than 2,200 acres of rolling land-

scape. True, the land is still scarred by gullies; but they are healing now under lush growing stands of planted pine trees and green expanses of pastureland. In preproject days, the land behind the dam that forms Garrett Lake bled tons of sediment into the streambeds after every rain.

A series of grade stabilization structures, placed at required locations along Capps Branch, are made of interlocking steel piling with rock riprap on the downstream side and create a waterfall effect. The waterfall action also mixes more life-giving oxygen into the water. In tests for dissolved oxygen, the biologists found the water to be about one part per million below saturation.

The Tennessee Wildlife Resources Agency collected fish from the pools, and a rather large variety was found. "We sampled the same area but found only four species," Dr. Deck said. "The difference is probably due solely to collecting methods since specialists of the Wildlife Resources Agency applied rotenone and we used seines."

Dr. Deck's report goes on to predict that the effect of the pools in small streams such as Capps Branch will be to modify the fish fauna in abundance and diversity. Several species will probably increase in abundance. Such forage species as gizzard shad, golden shiner, topminnows, and mosquitofish would likely become more abundant in the slower water habitat. Dr. Deck's report concludes that an increase of these types would facilitate an increase of some other slower water fish-eating forms such as several species of sunfish, bass, and crappies. Probably some rough fish such as carp, gar, and bowfin would increase as well. ♦

South Dakota Conservation District Sets Up 'Drive It Yourself' Tour

A "drive-it-yourself" conservation tour has been developed by the Lincoln Conservation District in South Dakota with the assistance of the Soil Conservation Service.

The tour has 20 stops along a 12-mile route in Newton Hills State Park in Lincoln County. To give a better understanding of the work local farmers are doing to protect their land, the tour includes terraces, waterways, diversions, field and farmstead windbreaks, and Lake Lakota, a flood prevention and recreation area—part of the Pattee Creek Watershed Project.

The conservation district also has prepared a color pamphlet, distributed at the park entrance. The pamphlet explains the benefits of the conservation practices depicted along the tour.

Dick Fossum, chairman of the board of supervisors of the Lincoln Conservation District, reports initial printing of the pamphlet was 5,000 copies, and requests have come in from several states, including New York and Colorado.

Among those farming in the tour area is the president of the South Dakota Association of Conservation Districts, Roy Larsgaard. — Joyce Watkins, SCS, Huron, South Dakota. ♦

DRIVE-IT-YOURSELF

*Conservation
Tour*

**LINCOLN COUNTY
SOUTH DAKOTA**



The Lincoln Conservation District invites you to join them on a twelve mile tour of Conservation practices. We hope this will give you a better understanding of the work that the local farmers are doing to protect their land.

The map (inside) will show you the route. The circled numbers on the map refer to numbers along the tour route and the numbers to the right of the map.

The roads are "all weather" surfaced; rain will not be a problem. Drive carefully and enjoy our agricultural scenery.

Copies of the "drive-it-yourself" conservation tour are distributed at Newton Hills State Park by parkettes employed by the South Dakota Department of Game, Fish, and Parks.



Prime Lands Seminar Makes Recommendations to USDA

by R. Neil Sampson

Resource Development Division, SCS, Washington, D.C.

The U.S. Department of Agriculture should be a strong advocate of protecting prime agricultural lands and oppose actions that would impair the nation's natural resource base for agricultural productivity.

That was the consensus of participants at the national Seminar on the Retention of Prime Lands sponsored by the USDA Land Use Committee in

July. The Land Use Committee is an interagency group that recommends policy and program initiatives related to land use to the Secretary of Agriculture.

Seminar participants stressed throughout the sessions that the fate of America's prime food, fiber, and timber-producing lands should be a concern of USDA, even though the supply of land seems adequate

to meet current and short-term needs.

Eighty land use and agricultural specialists from federal, state, and local agencies, universities, industry, private research institutions, agricultural organizations, and citizens' groups participated in the seminar. They prepared situation papers and recommendations to USDA dealing primarily with one major question: How important is the continued shift of prime agricultural land into other land uses that may, for all practical purposes, remove the land from agricultural production permanently?

Estimates developed by the USDA Economic Research Service, using census data, recent production and export trends, and the 1967 Conservation Needs Inventory, indicate ample undeveloped land in Capability Classes I, II, and III to meet food production



At the Seminar on the Retention of Prime Lands, reports were developed in small working groups, then presented to the seminar for adoption. This group's task was to consider methods of implementing plans to guide land use. Shown are (l. to r.) Milton Patton (back to camera), Council of State Governments, Chairman; Warren Zitzmann, Soil Conservation Service; Robert Anderson, Langston

University (Oklahoma); Stanwood Cath, National Association of State Departments of Agriculture; Robert W. Long, Assistant Secretary of Agriculture; Einar Roget, Forest Service; David Mosena (foreground), American Society of Planning Officials; Alice Klavans, League of Women Voters; and Wallace Washbon, Agricultural Consultant (New York.)

needs under normal population trends, continued increases in productivity per acre, and normal levels of export.

The conference recommendations noted that these assumptions should not be used, however, to reach the conclusion that there was little concern in America for protecting the prime producing lands. To the contrary, the draft report cited reasons for immediate concern at all levels of government. These include:

- Existing data are inadequate to indicate what is happening to prime lands. The top yielding lands of the country have not been identified and inventoried to provide information on how much prime land exists, where it is located, or the present and possible future rate of its conversion to other uses.

- National production needs as expressed in the analysis of total food production and total cropland acres may mask important shifts in land use that occur on a local, state-wide, or regional scale. Some areas of the country are deeply concerned about the loss of agricultural land because of economic, social, and environmental impacts on communities or regions.

- Much of the Class I, II, and III land remaining in the country may be in small scattered tracts, fragmented ownerships, or areas lacking an established agricultural infrastructure. The economic costs of bringing such land into production may be much higher than with the costs of retaining productive prime land in its present use.

- There is no clear evidence that land use controls, financial incentives, tax programs, or other devices used to date have been successful in retaining prime agricultural lands. If USDA, states, or localities decided to embark on active programs to retain prime lands, a great deal of research and experimentation may still be required.

Seminar participants recommended that USDA:

- Seek establishment of a

Prime Lands

Background papers for the Seminar on the Retention of Prime Lands have been published in a 257-page document, "Perspectives on Prime Lands."

The publication contains 9 major papers and 36 reviews covering the prime lands question. Differing viewpoints on the extent and importance of the issue, along with many suggestions for local, state, and USDA action are expressed.

Copies are currently being distributed through SCS, Extension Service, Farmers Home Administration, Forest Service, and the Council of State Governments. Additional single copies are available from the Information Division, Soil Conservation Service, Washington, D.C. 20250.

Preparation of the seminar proceedings and recommendations is underway, with publication anticipated in December 1975.

Land Resources Council or a combined Land and Water Resources Council, patterned after the existing Water Resources Council, to provide a coordinated federal input into future land use policies and programs of the federal government.

- Advocate a policy of retention of prime agricultural lands. Federal programs should avoid, wherever possible, the diversion of highly productive croplands to nonagricultural uses. Federal agencies preparing Environmental Impact Statements on projects that would take prime lands should demonstrate that the intended use is more in the public interest than agriculture.

- Encourage the development of a national classification system and move speedily to inventory the amount and location of prime lands. This system should be based on the soil survey, with the addition of economic and other criteria if possible. Soil surveys should be completed as rapidly as possible on agricultural lands.

- Utilize its educational and technical assistance programs to help state and local governments evaluate different implementation techniques that may be helpful in efforts to retain prime land in production.

The recommendations from the seminar are currently under study by the USDA Land Use Committee, and it is certain that the subject of prime agricultural land will be a topic of policy discussion in the Department for some time. ♦

Recon . . . Soil surveys

Topsoil loss. Statewide, about half of the topsoil on unprotected sloping land in Iowa has eroded away since it was first cultivated 100 to 150 years. That estimate by Lacy Harmon, SCS's state soil scientist in Iowa, translates into about 6 inches of topsoil on land that initially had from 12 to 16 inches. Harmon estimates that on much of the sloping land in the state, losses average 13 tons an acre—a twelfth of an inch of topsoil—a year.

Farmers, who once formed the bulk of business for SCS in Harris County, Texas, now make up only one-tenth of 1 percent of the population, notes SCSer David L. Myers in an interview in the *Houston Chronicle*. "Less of our work is concerned with the rural land user and more with the city dweller," said Myers, district conservationist in Houston for the 1.2-million-acre county. About half of the telephone calls his office receives are about flood plains, plain management, or flood control.

Arizona

Apache County (Central Part). By Mack L. Miller and Kermit Larsen. 1975. Soil Conservation Service in cooperation with Arizona Agricultural Experiment Station. 71 pp., illus.; maps.

Florida

Holmes County. By Julius L. Sullivan. 1975. Soil Conservation Service in cooperation with University of Florida Agricultural Experiment Stations. 61 pp.; illus.; maps.

Georgia

Colquitt and Cook Counties. By John W. Calhoun and Joe G. Stevens. 1975. Soil Conservation Service in cooperation with University of Georgia, College of Agriculture, Agricultural Experiment Stations. 68 pp., illus.; maps.

Iowa

Linn County. By Edward J. Schermerhorn and John D. Highland. 1975. Soil Conservation Service in cooperation with Iowa Agriculture and Home Economics Experiment Station, Cooperative Extension Service, Iowa State University, and the Department of Soil Conservation, State of Iowa. 149 pp., illus.; maps.

Mitchell County. By Kermit D. Voy and John D. Highland. 1975. Soil Conservation Service in cooperation with Iowa Agriculture and Home Economics Experiment Station, Cooperative Extension Service, Iowa State University, and the Department of Soil Conservation, State of Iowa. 125 pp., illus.; maps.

Kansas

Riley County and Part of Geary County. By Donald R. Jantz, Rodney F. Harner, Harold T. Rowland, and Donald A. Gier. 1975. Soil Conservation Service in cooperation with Kansas Agricultural Experiment Station. 71 pp., illus.; maps.

Missouri

Mark Twain National Forest Area. (Parts of Carter, Oregon, Ripley, and Shannon Counties.) By Jerry D. Gott. 1975. Forest Service and Soil conservation Service in cooperation with Missouri Agricultural Experiment Station. 56 pp., illus.; maps.

Oklahoma

Haskell County. By R. C. Brinlee. 1975. Soil Conservation Service in cooperation with Oklahoma Agricultural Experiment Station. 78 pp., illus.; maps.

Oregon

Benton County Area. By Clarence A. Knezevich. 1975. Soil Conservation Service in cooperation with Oregon Agricultural Experiment Station. 119 pp., illus.; maps.

Pennsylvania

Bucks and Philadelphia Counties. By Edward A. Tompkins. 1975. Soil Conservation Service in cooperation with the Pennsylvania State University, College of Agriculture, and the Pennsylvania Department of Environmental Resources, State Conservation Commission. 130 pp., illus.; maps.

Meetings

South Dakota

Marshall County. By Loren D. Schultz. 1975. Soil Conservation Service and United States Department of the Interior, Bureau of Indian Affairs, in cooperation with South Dakota Agricultural Experiment Station. 116 pp., illus.; maps.

Texas

Borden County. By Marvin L. Dixon. 1975. Soil Conservation Service in cooperation with Texas Agricultural Experiment Station. 68 pp., illus.; maps.

Washington

Chelan Area. (Parts of Chelan and Kittitas Counties.) By Vern E. Beierler. 1975. Soil Conservation Service in cooperation with Washington Agricultural Experiment Station. 104 pp., illus.; maps.

Wisconsin

Dunn County. By Gordon N. Wing. 1975. Soil Conservation Service in cooperation with Wisconsin Research Division of the College of Agriculture and Life Sciences, University of Wisconsin. 117 pp., illus.; maps.

Marquette County. By Keith O. Schmude. 1975. Soil Conservation Service in cooperation with The Research Division of the College of Agriculture and Life Sciences, University of Wisconsin. 91 pp., illus.; maps.

October

- 2-3 American Forest Institute, Philadelphia, Pa.
- 4-8 American Bankers Association, New York, N.Y.
- 5-8 American Forestry Association, Washington, D.C.
- 5-9 National Association of State Department of Agriculture, Charleston, W. Va.
- 5-10 Water Pollution Control Federation, Miami Beach, Fla.
- 7-10 National Conference of Editorial Writers, Philadelphia, Pa.
- 14-17 Association of Engineering Geologists, Lake Tahoe, Calif.
- 15-18 National Council For Geographic Education, Toronto, Canada
- 17-18 International Women's Year, Syracuse, N.Y.
- 19-23 National Recreation and Parks Association, Dallas, Tex.
- 19-24 SCS State Conservationists Annual Meeting, Mobile, Ala.
- 20-22 Geological Society of America, Salt Lake City, Utah
- 23-26 National Association of Biology Teachers, Inc., Portland, Oreg.
- 24-29 American Institute of Planners, San Antonio, Tex.
- 24-31 National Environmental Sanitation and Maintenance Educational Conference and Exposition, Clearwater, Fla.
- 27-
- Nov. 1 Adult Education Association of the U.S.A., Salt Lake City, Utah
- 30-31 American Association For Vocational Instructional Materials, Columbia, Mo.

November

- 2-5 Sprinkler Irrigation Association, Scottsdale, Ariz.
- 3-7 American Society of Civil Engineers Convention, Denver, Colo.
- 4 American Seed Trade Association Farm Seed Conference, Kansas City, Mo.
- 9-14 National Water Resources Association, Honolulu, Hawaii
- 10-18 National Grange, Columbus, Ohio
- 11-14 Future Farmers of America, Kansas City, Mo.
- 12-13 14th Annual Purdue Air Quality Conference, Indianapolis, Ind.
- 16-19 American Bankers Association, National Agricultural and Rural Affairs Conference, Houston, Tex.
- 16-20 American Institute of Chemical Engineers, Los Angeles, Calif.
- 17-20 American Association of State Highway Officials, St. Louis, Mo.
- 30-
- Dec. 2 American Society of Farm Managers and Rural Appraisers, Inc., Dallas, Tex.

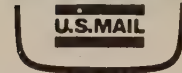
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U. S. Department of Agriculture / Soil Conservation Service / November 1975



Soils: Limitations vs. Potentials

In years past, the tables in a published soil survey have told a land user about his soils mainly in terms of their "limitations." A survey might describe a particular soil as having "moderate limitations" for crops or "severe limitations" for a septic tank filter field. Discouraging news for the farmer or homeowner who already owns the land and must make use of it!

The fact is, of course, that many soils, even those with "severe limitations," can be made to serve if the land user is willing to spend money to modify the soil, plan special designs, or adjust his way of operating.

In future surveys, the Soil Conservation Service will emphasize a more positive approach called "soil potentials." We are going to give the land user more information about soil behavior so that he can better plan and evaluate alternative uses of his soil. New surveys will still warn of "limitations," but they also will describe ways to correct those limitations.

A farmer faced with "severe limitations" for cropland may discover that his sloping acres can be used for corn and small grains under no-till farming. Or he may turn to

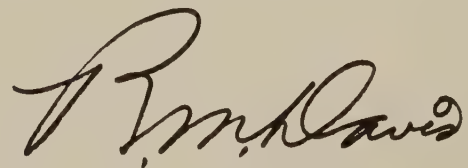
parallel terraces with tile drain outlets to make them usable.

Another farmer may discover "wet" soils in part of a field can be serviceable for crops if he installs tile drains—and that the increase in yield will offset the cost of drainage.

A rural householder with soil too shallow for a septic tank filter field—and no hope of getting town sewage—may discover that he can get around his problem by building up a mound of permeable soil and setting his tank on top.

The new surveys also will offer builders, developers, and county officials more alternatives in planning future projects. In the past, developers have concentrated on soils with "slight limitations" for construction. Many of these soils also are prime farmland and should be left in crops. Since soil surveys will henceforth give planners more detailed information about building on soils with moderate or severe limitations, planners can weigh alternatives more realistically before taking Class I and II land out of agriculture.

This positive approach—the "soil potentials" approach—should increase the usefulness of published soil surveys to the people who use them and to the SCS field people who assist them.



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Earl L. Butz
Secretary of Agriculture

R. M. Davis, Administrator
Soil Conservation Service

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Contents

- 2** From the Administrator
- 4** Paddling on the Potomac
Debra Arlean Tate
- 8** Conservation and Environment
Russell E. Train
- 12** 'Limits'
- 14** Silver Creek Watershed
Gorgie E. Hofma
- 16** Nesting News for Wood Ducks
Frank Jeter, Jr.
- 17** Livestock Pipeline Aids Great Plains Ranchers
Donald E. Stearley and Randy Patefield
- 18** Iowa Farmers Plant 'Acres for Wildlife'
Jim Allen
- 19** Pondweed Project
David W. Patterson
- 20** League of Women Voters States Position on Land Use
- 20** Outdoor Classroom on the Outer Banks
David Hardee
- 21** Conservation Tours Attract 3,500 North Dakota Students
- 22** Soil Surveys
- 23** Meetings

COVER: Contour stripcropping and grass waterways in the Lincoln Soil Conservation District in South Dakota illustrate some of today's conservation practices. In a new Bicentennial slide show, the Soil Conservation Service traces the idea of conservation in America over the last 200 years. See page 12.



To travel a river from its source to the sea—discovering its pageantry, meeting its people and witnessing its problems—is to understand a region and its environment in the most intimate sense.

In August, five high school students selected from conservation districts within the Potomac River Basin completed a month-long journey down the Potomac River from its source at Fairfax Stone, West Virginia, to Point Lookout, Maryland, where the river enters the Chesapeake Bay.

In an effort to focus on the natural, historic, and ethnic riches of the Potomac as well as define specific environmental problems plaguing the 385-mile river, the students, accompanying a throng of conservationists, traveled by foot, horse, canoe, bicycle, coal train, boat, and bus during the trip.

The Interstate Commission on the Potomac River Basin spearheaded the contest for students to participate in a trip that would be both a unique

The group put in at Antietam Creek, stopping long enough for lunch and to hear a brief history of the area from a National Park Service representative.

Paddling on the Potomac

by Debra Arlean Tate

Information Division, SCS, Washington, D.C.

educational bonanza and the 20th century answer to a Mark Twain adventure. Anne Blackburn, public education specialist for the commission, explained that after much discussion over a student selection method, the commission decided "that the conservation districts offered an excellent vehicle through which to reach potential applicants . . . because of their longstanding involvement in sound resources management and their consciousness of the need for people to understand the science and art of good land use."

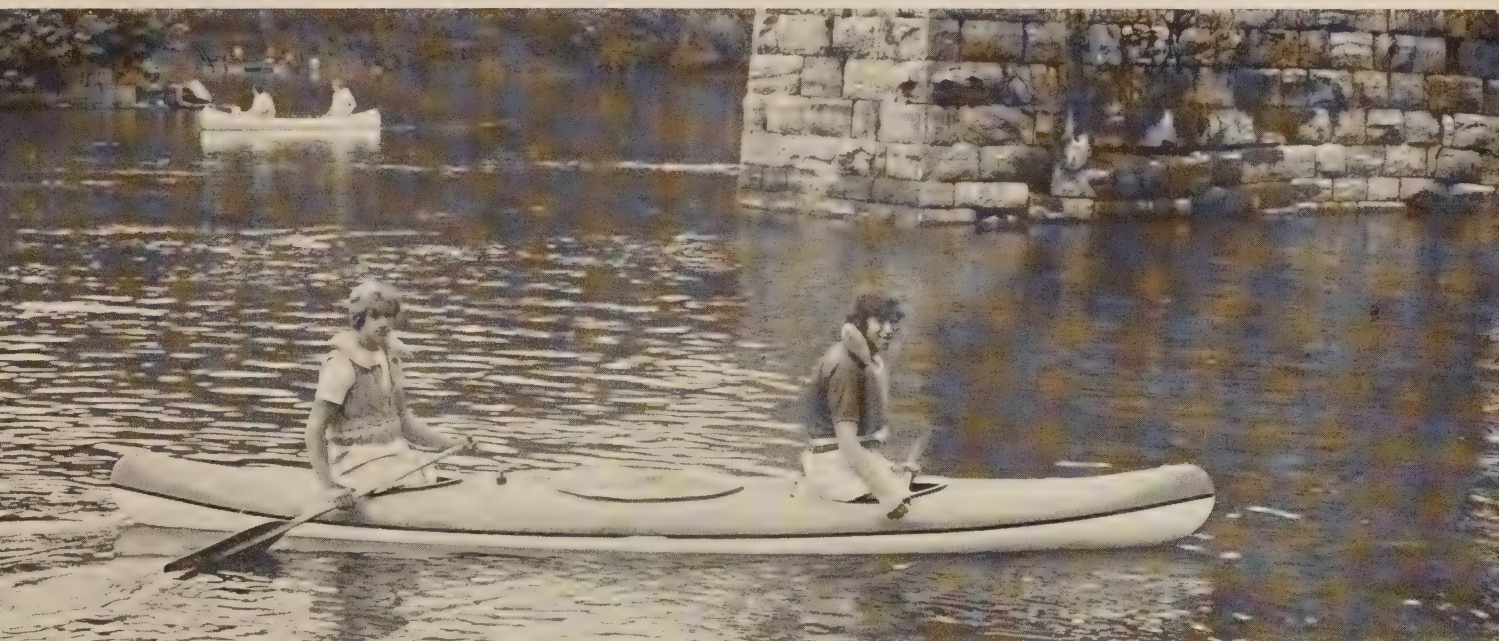
In April, letters outlining the proposed trip along with application forms were sent to the chairmen of the 26 districts totally or partially in the 14,670 square mile basin. After sufficient publicity and distribution to 4-H clubs, Scouts, Future Farmers, etc., completed applications were returned to each district chairman for selection of a district finalist. Extremely impressed by the keen interest and enthusiasm of the finalists, the commission decided to sponsor five students: Karen Frye, 18, of Washington, D.C.; Douglas Kint, 17, of Gettysburg,

Pennsylvania; Elizabeth Harmison, 17, of Berkeley Springs, West Virginia; Matt Westbrook, 16, of Bowie, Maryland; and David Wiley, 16, of Purcellville, Virginia.

The students were accompanied by some of the staff of the commission and one of its commissioners; U.S. Representative Gilbert Gude of Maryland, who assisted in planning the trip; and representatives from the Izaak Walton League, the League of Women Voters, the C & O Canal Advisory Commission, and other environmental and conservation groups.

The source of the river is so small, explained Karen Frye, "you could spit more water than was coming out of the stream." The students had only to hike 500 yards before seeing the orange-brown water of acid mine drainage. "It drains through abandoned coal mines into the river and makes it so acidic fish can't live," reported Matt Westbrook. This barren environment is compounded by the dumping of waste by small towns lacking proper sewage treatment facilities.

Douglas Kint (right) and friend rest for a moment before starting the 12-mile trek to Harpers Ferry.



During the trip the students periodically tested the acidity of the river.

Hiking and biking 8 to 14 miles a day the first week, the group toured a paper mill in Luke, Maryland, and examined reclaimed surface-mined land that had been planted for future forests. An 18-year-old minimum age limit prevented four of the students from tour-

ing the Island Creek Coal Company in Bayard, West Virginia. While they surveyed the top-side of the mine, Karen Frye and the rest of the group, donned hard hats and protective clothing to descend underground to examine the workings of an active coal mine. "It was one of the most exciting events of the trip," Karen said. Enthusiatic coopera-

tion from industries along the river added much to the educational and environmental input.

All experienced canoeists, the students utilized their skills in a 12-mile canoe trip from Shepherdstown, West Virginia, to historic Harpers Ferry. They noted that as the geography of the river changed, so did the types of pollution. Muddied water entering from Antietam Creek indicated heavy farm and construction erosion upstream. Where the river was moderately shallow and slow, intense recreational use by motorized vessels such as outboards, houseboats, and modified hydrofoils caused shore erosion in areas due to heavy wave action. The gnarled, exposed roots of towering silver maples and sycamores measured the extent of soil loss.

Wider in places than the Mississippi River, the Potomac estuary provides livelihoods for many who live on its shores, but not without numerous environmental setbacks. At a meeting in Colonial Beach, Virginia, of the Potomac River Fisheries Commission, local oystermen, fishermen, and interested residents, the students learned of the devastating effect of unchecked upstream pollution on estuarine wildlife. Sediment deposits have dis-



Fred B. Givens, Jr., SCS civil engineer at Warsaw, Virginia, discusses methods of shore erosion control with the group at Stratford Hall.

rupted the delicate balance of freshwater and saltwater and covered oyster "starter" beds and breeding grounds for fish. Sewage overflows from urban areas can limit seafood harvests by rendering shellfish inedible.

Many local, regional, and state conservation and environmental groups assisted in providing information and tours of specific projects, as well as housing and meals. Cooperation from federal agencies came from the National Park Service, Environmental Protection Agency, the President's Council on Environmental Quality, and the Soil Conservation Service. SCS representatives were on hand to discuss soil erosion on a farmsite along the Monocacy River and explain the use of jetties in curtailing beach erosion at Stratford Hall, Virginia.

Trip highlights included visits to historic homes and sites along the Potomac. A hike-bike tour of Georgetown and Old Alexandria revealed that ports for tobacco, the colonial cash crop, were the basis for colonization of the two cities. The group dined at Gunston Hall, home of George Mason, as well as Stratford Hall, birthplace of Robert E. Lee. At Wakefield, Washington's birthplace, the students watched oxen till with a wooden plow as was the

mode in the 1700's and sampled sugar cookies made from a Washington family recipe.

After 385 miles, the kids were sunburned, footsore, several pounds lighter, and in unanimous agreement about the invaluable knowledge they reaped from the trip. Considering the different types of pollution plaguing the river and the individual interest groups

involved, David Wiley realized that you "can't make one solution work for everyone." Elizabeth Harmison was struck by an urgent need that "we all have to participate to save the river." Matt Westbrook probably summed up the group's feelings best when he said that the trip was, above all, "something that was going to be remembered forever." ♦

Elizabeth Harmison checks for correct paddle height before setting off down the Potomac River from Shepherdstown, West Virginia.



Conservation and Environment

by Russell E. Train

Administrator, U.S. Environmental Protection Agency, Washington, D.C.

Long before the word "environment" became part of the average citizen's lexicon, the conservation districts of America were making a major and largely unheralded contribution to this cause.

It was four decades ago this year that public agitation over the problems of dust storms, floods, and major erosion led to a new law declaring soil and water conservation and wise land use a national policy. Strong support from the White House opened the way for state authorization of today's 3,000 conservation districts. The importance of these districts, operating close to the problems and serving as both clearing houses and classrooms on conservation matters, cannot be overstated.

Today, we are again at a critical time in the conservation movement. It is no longer a question—if, indeed, it ever really was—of whether the nation should pursue conservation measures more vigorously, but where and how. Informed observers in the field of agriculture and in Congress have become increasingly concerned that we may, in fact,

be recreating those conditions that led to such grave consequences 40 years ago in the Great Plains.

A study published by the Senate Agriculture Committee last March warned that the farm community may be creating another Dust Bowl. Among the conditions that could trigger this disaster, if a sustained drought should occur in the Great Plains, is the trend among farmers to shift from crop rotation to continuous wheat planting. In the drive to meet world food demand, we are converting vast areas of dry grassland into farmland, although there is little prospect that this acreage, stripped of its grass cover, can withstand the erosion from strong, relentless prairie winds.

The Soil Conservation Service estimates that nearly 9 million acres of unfarmed land were put to the plow last year, more than half of it idle since the droughts of the 1930's. The Service declares that less than half of this new land is being farmed with adequate erosion control and that some 60 million tons of topsoil were lost from the new acreage in 1974 alone.

Increased food production is, of course, not only a major national goal, but a matter of global necessity. Our exports of food and fiber help relieve

a worldwide shortage and also make a substantial contribution toward our balance of payments. We need to increase this output, but not at the expense of the soil and not in a wasteful, short-term burst of careless farm management that exposes the land to long-term loss of its precious fertility. For the sake of future generations of Americans, and indeed for hungry people around the world, we must accompany our increased food production with sound principles of conservation, such as crop rotation, contour plowing, and stripcropping.

The Environmental Protection Agency (EPA) is especially concerned with this problem because sediment from land erosion also constitutes a serious pollution threat to the nation's lakes and waterways. As the Senate Agriculture Committee has pointed out, sediment is by far the major pollutant of surface waters. Our rivers and streams are not only turned muddy by the runoff of topsoil, but they are contaminated by the nutrients and pesticides carried there through the normal movement of wind and water. This represents a loss to the waterways and a loss to the land. Based on the 1972 market value of fertilizers, an estimated \$800 million was lost that year in available nu-

Adapted from speech by Russell E. Train to the Upper Mississippi regional meeting of the National Association of Conservation Districts, July 16, 1975, in Bettendorf, Iowa.

trients, and the value of nutrient losses last year was at least 50 percent greater. At the same time, the outlays for dredging channels and harbors and coping with reservoir sedimentation, flood plain overwash, and turbidity removal push the cost hundreds of millions of dollars higher.

The technology of sedimentation control is well known. Some of the methods, indeed, date back thousands of years to terracing developed in the Orient. Watershed studies have demonstrated that good conservation practices can reduce sediment yield anywhere from 50 to 90 percent. And it is the conservation districts of America that form the front line in any such fight to maintain the quality of our croplands for future generations.

The term generally used to describe such problems as sediment runoff is "nonpoint sources" of pollution. A court decision this past March has placed in question the precise definition of "nonpoint sources," so I use it here in a general way, without spelling out how any specific discharge of a pollutant would be controlled at a state or federal level.

Since about 97 percent of the nation's land is rural, essentially all of it is a potential cause of this kind of problem in

waterways. Three years ago, EPA's regional offices estimated that approximately 35 percent of the nation's waterways had water quality standards violations and that about 40 percent of these problems were attributable to nonpoint sources. More recently, it has been estimated that discharges from these sources have resulted in water quality degradation in every state. The runoff and sedimentation come not only from farms, but from forests and mines.

It should be emphasized that the technology of erosion control is no secret, and that prevention rather than cure is by far the most preferable course of action to deal with this form of pollution. We are disbursing billions of dollars in this decade for construction of wastewater treatment systems in America's cities, but unless an effort is made simultaneously to abate and control nonpoint source pollution, our tax dollars will not achieve the goal of clean waters that we all seek.

For most of the past four decades, erosion control programs relied to a large extent on voluntary action by landowners with technical advice from the National Association of Conservation Districts and federal and local agencies. However, during the 1960's there was growing realization

that many erosion and sediment problems were being caused by housing, industrial, highway, and other construction activity, and that some other legal teeth would have to be put into the conservation effort. The result initially was a number of local ordinances to prevent erosion and sediment runoff.

Then in 1972, the Environmental Protection Agency, together with the Soil Conservation Service and the National Association of Conservation Districts (NACD) sponsored the development of model state legislation. As a sequel to this, a dozen states have enacted laws or taken executive action to control erosion and sediment, and 15 others have prepared new legislation.

So we have made a good beginning in this new enforcement activity to preserve America's farmland and to purify her waterways and lakes. EPA is now providing NACD with a grant to set up a manpower and training program in Washington to help staff state soil and water agencies and conservation districts to administer sediment and soil erosion control plans.

The foundation for EPA's authority is the Federal Water Pollution Control Act of 1972. One of its purposes is to identify and set forth methods to

control nonpoint sources of water pollution from agriculture and forestry. The section 208 program of the Act can be an effective tool for the states, which have primary responsibility for nonpoint sources management. Establishing nonpoint source management programs will be a part of the areawide planning process in designated 208 areas as well as a part of the state water quality management responsibilities in nondesignated areas.

The role of EPA will be to provide guidance to the states for initiating planning and carrying out nonpoint source management. The Agency also has the responsibility of reviewing and approving state plans in this area. We have recently issued revised state water quality management regulations and this will be followed by guidelines issued early next year. These will require states that have not already done so to begin planning for nonpoint source management programs.

For its part, EPA will encourage states and local agencies to use so-called best management practices. For the most part, effective land management practices are known and many are in daily use. But unfortunately these techniques are not being widely applied in many areas where serious water quality degradation is occurring. In addition, new tech-

niques are continually being developed by the states, EPA, and other federal agencies, and these must be put to work as they emerge from the testing process. Each state will define its own set of such practices, tailored to meet specific local problems and environmental conditions.

These practices will be determined after study of many factors, such as local soil, rainfall, slope, as well as the kind of activity generating the pollution, such as farming, forestry, or construction. They will also take into account the water quality needs of the area basin. What this means is that for agriculture we are asking that water quality be incorporated into farm and watershed conservation plans.

It is obvious that this effort to control nonpoint source pollution calls for a partnership between EPA and the states. We will have shared responsibilities. We will expect the conservation districts and state soil and water commissions to assume leadership in the administration of this program. And the effort will call for close cooperation.

All federal and local governmental bodies must work together if we are to proceed in an orderly fashion to protect the land, as illustrated by a little problem we had with the Corps of Engineers regarding

section 404 of the Water Act. I have made clear to the Corps that a farmer won't have to get a government permit every time he wants to plow his land. That was, of course, never contemplated by Congress in writing the Act, nor was there any intent to regulate plowing or soil disturbing practices on farms or forest lands under section 404.

In another area, we are cooperating with the U.S. Forest Service after establishing committees to oversee not only local planning programs but environmental protection in timber harvesting. These committees also will report on possible aid to section 208 agencies by the Forest Service.

We have been working with the Department of Housing and Urban Development and the Coastal Zone Management Program to incorporate our requirements in their programs. We also are endeavoring to include other agencies such as the Department of Transportation, which is a major source of federal support in construction work.

Earlier I spoke of the concern by members of Congress that American agriculture may be creating conditions reminiscent of the 1930's. Some of the distant memories of that period have been returning in recent time in other respects. While our economy now seems

to have weathered the worst of the current recession, the experience has prompted planners in Washington and elsewhere to consider a variety of ways in which government might create jobs if unemployment should persist.

Certainly many meaningful and positive public-service programs could be devised in the area of environmental protection and soil conservation. For example, rural roads and their drainage systems long have been recognized as major sources of sediment. Surfacing these roads would reduce the sedimentation load, and seeding and planting road shoulders would further reduce erosion.

In the field of construction, the construction of dikes, as well as reseeding of grass and planting of shrubs and trees, would help to control runoff and pollution in nearby waterways.

The problem of combined storm and sewage mains, which contributes heavily to river pollution during storms due to overflows, could be corrected by public works programs.

An increased program of reforestation and of tree plantings as windbreaks, particularly in areas where erosion and sediment pollution are evident, offers another opportunity. We have seen in the Middle East and in the Mediterranean lands

how formerly green fertile regions have become barren, their topsoil washed away, their peoples' standard of living depressed, all because of thoughtless overcutting and overgrazing and neglect of conservation measures over the centuries. I can think of no national need more fundamental or imperative than the preservation of our land from a similar fate.

The plentiful supply of cheap energy, which made possible the impressive productivity of our agriculture in recent decades through intensive use of fertilizer and pesticides, has vanished. The U.S. Geological Survey last June disclosed that the nation may have only half the undiscovered oil and gas resources thought to exist a year ago.

This means that we must, for survival's sake if nothing else, find ways of managing our environment that conserve not only the land but energy and its related components of fertilizer, pesticides, and water. In doing this we must also avoid practices that render the natural world that supports us increasingly inhospitable, if not uninhabitable. We need, in short, to develop an agriculture that we can live with over the long term, that can sustain us over the next few decades, especially through the end of this century when the world popu-

lation will probably double and the pressures upon our productive capacity, as well as that of the world, will become increasingly severe.

Such an agriculture must seek to conserve its resources, especially those that cannot be renewed. It must place the highest priority upon retaining our fertile topsoil, whose supply is finite and which cannot be replaced over aeons of time.

No group has a greater stake than landowners in protecting their environment from the ravages of nature and careless men. And no environmentalist can fairly say he supports his cause unless he includes the preservation of America's farmlands and forests through wise conservation measures.

Conservationists and environmentalists are going to need each other in the years ahead. None of us can afford to go it alone. Thanks to the far-reaching 1935 act that paved the way for conservation districts, and the 1972 Water Act that made it possible for EPA to work with the conservation movement in helping to preserve the land, we have the legislative framework for close cooperation. We share common problems and common goals, and, based on our experience thus far, it will be a successful partnership. ♦

'Limits'

A new slide show, prepared for the Bicentennial, traces the development of the conservation idea in America during the last 200 years.

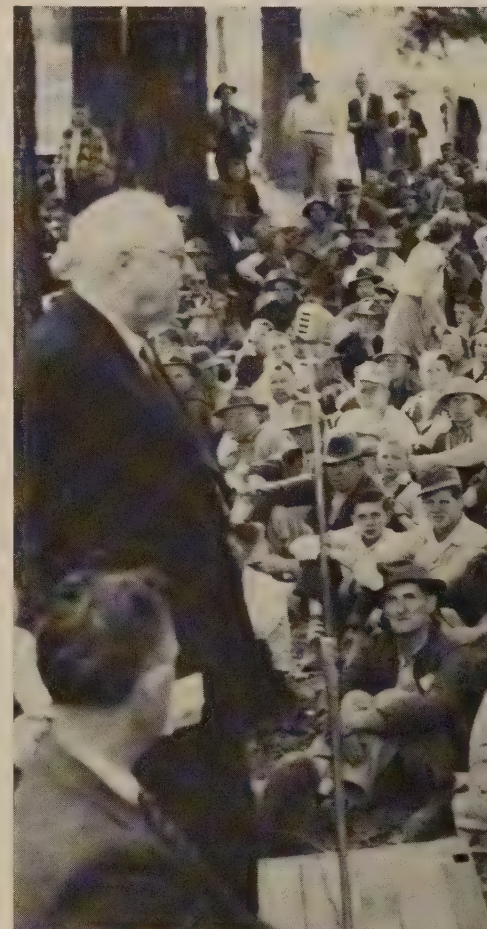
"As we begin our third 100 years as a nation, we begin with the hard-earned knowledge that there are limits to our resources, and limits to the way we can treat them."

So states "Limits," the new Bicentennial slide show prepared by the Division of Information, Soil Conservation Service.

"Limits" traces the history of the conservation movement in America, opening with settlers in the New World, when resources seemed limitless.

The slide series will be available in December 1975 from the Office of Communication, Photography Division, U.S. Department of Agriculture, Washington, D.C. 20250. The price of the 80-slide set is \$16.50, which includes the narration on a cassette.

From "Limits": At left, a scene of severe erosion. Below, Hugh H. Bennett, first chief of SCS, addresses a group at a soil conservation demonstration on a Kentucky farm in 1948. At top right, stripcropping on an Ohio farm.





Silver Creek Watershed

by Gorgie E. Hofma

SCS, Huron, South Dakota

Twenty years ago, a farmer in southeastern South Dakota summed up a problem he and neighboring landowners had: "We get a lot of water here without any rain."

Pinpointing the problem, an agreement among the farmers that "something must be done" to protect cropland from re-occurring heavy runoff resulted in the Silver Creek Watershed

Project—a project which covers 20,660 acres and includes six floodwater retarding dams.

Today, the Silver Creek Watershed Board of Managers reports that the project provides protection for 52 landowners to utilize fully the 4,200-acre flood plain. Conservation land treatment measures reduce soil erosion about 27,000 tons per year and reduce sedi-

ment entering the structures of streams by 2,700 tons annually.

The watershed project came about with the help of a determined and enthusiastic Watershed Steering Committee and Board of Supervisors of the Minnehaha Conservation District.

Faced with heavy runoff from the uplands and three crop failures in 10 years because of

Curtis Eggers (right), chairman of the board of managers of the Silver Creek Watershed District, and Nils Aspaas, the first chairman of the board, at the dedication of the Silver Creek Watershed Project.



too much water, the committee and the board found strong support in the area for a watershed program administered by the Soil Conservation Service under Public Law 566.

A report from one of the early planning meetings of these two groups notes: "Sheet erosion can be checked by our land treatment program, but we definitely need detention dams and supporting conservation practices to keep excess water off valuable bottomland. Pastureland could be cropped if floodwaters could be kept off. Average yields on the bottomland, if protected, would be much higher than on upland. Annual fence and road damage is high, particularly where the sharp draws empty onto the flat land."

Planning authorization for the Silver Creek watershed was received in 1955 and the project was approved in 1957 for construction. The watershed district was organized the next year.

A "Who's Who in Cooperation" resulted, with interest and cooperation from the Extension Service, Agricultural Stabilization and Conservation Service, South Dakota Department of Game, Fish, and Parks, U.S. Fish and Wildlife Service, South

Dakota Water Resources Commission, South Dakota Conservation Commission, Big Sioux Watershed Association, county commissioners, township boards, city commissioners, Sioux Falls businesses, commercial clubs, and the backbone of the entire endeavor, the landowners.

By 1959, 81 percent of the landowners in the project area were either installing or had completed needed conservation practices. Four of the six floodwater retarding dams were completed by 1962. During the next 10 years, problems involving location of dams and obtaining easements halted construction work, but, in 1972, these were resolved and the dams were completed.

"We are a goal-oriented people," said Odilo Hensen, chairman of the Minnehaha Conservation District Board of Supervisors. "For our type of diversified farming with most of the crops and hay produced being used in our livestock industry, we are looking forward to realizing 30 to 35 percent increased production now that we can plant on time and can use fertilizers without the fear of them being washed away."

Fence damage, removal of trash, and weed infestation pre-

viously cost a landowner \$7 to \$8 an acre. The project is estimated to reduce damage to fences, roads, and other non-agricultural property 65 percent.

Channel work was planned to preserve oxbows and trees, explains Charles D. Culhane, SCS district conservationist for Minnehaha Conservation District. Sediment traps provide pool areas for wildlife, and native grasses supply food and cover for birds and animals.

Work will continue in the watershed area to insure continuing benefits. The channel must be kept free of willows that would clog the channel floor. The artificial inlets in the channel banks that return minor overflows to the channel must be maintained and the grazing of native grasses along the channel must be controlled. Terraces need to be maintained, contour farming continued, and feedlots need to be planned to prevent pollution.

As one farmer in the flood plains commented, the sponsors and landowners have an increasingly important role in encouraging application of conservation measures to further preserve and enhance land and water resources in the Silver Creek watershed. ♦

Nesting News for Wood Ducks

by Frank Jeter, Jr.

Information officer, SCS, Raleigh, North Carolina

Wildlife enthusiasts in North Carolina's populous Piedmont are doing something about the "housing shortage" for wood ducks.

More than 100 nesting boxes were put up last spring and 200 more this fall in six counties—Alamance, Caswell, Chatham, Guilford, Orange, and Rockingham.

The idea for the boxes gained momentum this year when the Wildlife Committee of the North Central Piedmont Resource Conservation and Development (RC&D) Project made constructing and distributing 100 nesting boxes a goal by spring.

The committee chairman, J. W. Busick, is a vocational agri-

culture teacher and adviser to a Future Farmers of America (FFA) chapter. Concerned about the increasing encroachment of human beings and the shortage of natural nesting sites for wood ducks in the area, Busick encouraged both the committee and the chapter to help out.

Randy Porterfield, district wildlife biologist with the North Carolina Wildlife Resources Commission, provided technical assistance on the proper installation of the boxes. The commission also started a banding program to develop statistics on duck populations and migration habits.

The RC&D Wildlife Committee has provided funds for 100

boxes, which were built by 65 members of the FFA chapter. The students held barbecue dinners to raise money to buy cypress lumber for the boxes and were later reimbursed by the committee.

The boxes are being sold to landowners at cost—\$5 each. The North Carolina Wildlife Resources Commission will also reimburse an organization for building boxes.

"The program is a very beneficial learning experience for young people," Busick said. "They are really learning something about the leading duck in North Carolina—its habits, its needs, and what it means to the people of our state." ♦



Wood duck nests have become a major project with the Western Alamance FFA chapter in North Carolina this year. Chapter Adviser J. W. Busick (left) has helped the students in building more than 120 nests.



Author Randy Patefield discusses range management with Jerome Lemmer.

Livestock Pipeline Aids Great Plains Ranchers

by Donald E. Stearley and Randy Patefield*

District conservationist, SCS, Lexington, Nebraska, and district conservationist, Lebanon, Indiana

On the eve of the worst drought in the Great Plains in 20 years, three Nebraska ranchers were confronted with the frightening situation of a livestock well going dry.

They had only one good well left and erosion problems soon began as cattle overgrazed and formed trails to the water facilities.

But by the time the drought struck a few months later, these men were watching their cattle drink from 10 stock tanks.

The changeover began when the three ranchers, Lyle Talbot, Niles Wallace, and Jerome

Lemmer, visited the Soil Conservation Service office at Lexington, Nebraska. Talbot and Wallace, who have 300 steers, had reached an agreement with Lemmer to hook into his well, put in the year before.

They qualified for technical help and cost sharing through the Great Plains Conservation Program (GPCP) and the Rural Environmental Assistance Program (REAP) for developing a livestock watering system. With assistance from SCS, they drew up ranch plans for proper grazing use and proper livestock distribution.

They buried 3½ miles of 2-inch plastic pipe below the freeze line—48 inches deep. The pipes lead from Lemmer's well to 10 steel tanks spotted

for maximum grazing distribution on the land owned by Talbot and Wallace. The stock tanks have float-controlled valves which keep them full at all times.

Total cost of the project was \$12,960, of which \$5,393 was cost shared under GPCP and \$1,990 under REAP.

Lemmer, who waters 550 head of cattle on his 2,240 acres plus additional rented acres, keeps a standby generator for emergencies. His main well is 330 feet deep and has an electric switch submersible pump and pressure tank.

The three newest Great Plains cooperators brought the total of ranchers installing similar systems in Dawson County to 14. The pipelines get water to many unused areas and relieve concentrated grazing pressures around limited main water supplies.

"Even in good years, cattle will bunch up around a central tank," said Warren E. Peden, Jr., SCS range conservationist for the Nebraska Panhandle area.

"Livestock trample down the grass, form paths to the watering facilities, and begin a gully or blowout. Spreading water facilities around prevents this bunching. Cattle normally will form little groups, not large herds."

When used in combination with other range management practices such as proper numbers of stocking, range rotation, placing salt locations away from water sources, and cross fencing, these pipelines facilitate maximum range use without abuse. ♦

* Formerly soil conservationist, SCS, Lexington, Nebraska.

Iowa Farmers Plant 'Acres for Wildlife'

by Jim Allen

District conservationist, SCS, Charles City, Iowa*

Normally, fewer than 10,000 trees are planted in a year in Winnebago County, Iowa.

Through a cooperative "Acres for Wildlife" program last spring, however, more than 70,000 trees and shrubs were planted to provide wildlife habitat on odd tracts on 80 farms in the county.

The project was coordinated by the Winnebago County

USDA Rural Development Committee. The committee, composed of federal, state, and county agencies, included representatives from the County Conservation Board, Agricultural Stabilization and Conservation Service, Iowa Conservation Commission, Extension Service, Rural Electric Cooperative, and Soil Conservation Service.

The committee began planning in January. Some 20,000 coniferous plants were donated by Winnebago Industries of

Forest City, and cash contributions for another 52,000 trees and shrubs were received from other county businesses, banks, civic organizations, and individuals. These were bought from the Iowa Conservation Commission's State Forest Nursery in Ames.

With enough trees and shrubs to plant more than 100 acres, the committee sought landowners to provide odd areas on their farms for the wildlife habitat plantings.

Through a series of newspaper articles, radio programs, and a newsletter sent out by the Agricultural Stabilization and Conservation Service, farmers were informed of the program. Farmers could fill out a card and send it to the Extension Service, listing the landowner's name, approximate size of the tract to be planted, and the present land use. Landowners agreed to prepare some of the land for planting and not to destroy the plantings.

More than 80 farmers donated 118 acres of land for the program. Individual planting tracts ranged from one-tenth of an acre to 16 acres, including steep side hills, corners of land cut off by railroads, open ungrazed woodlands, land near ponds, marshy areas, and areas along drainage ditches.

Areas donated were divided among Rural Development Committee members for study. Each member determined access to the tract, the type of vegetation present, whether a mechanical tree planter could be used in the area, and whether the planting site was

* Formerly district conservationist, SCS, Thompson, Iowa.



Two members of the tree planting crew, hired with Federal Public Employment Program funds, plant "Acres for Wildlife."

dry, moderate, or wet. A tentative plant allocation was made at this time, using a guide prepared by the Iowa Conservation Commission and SCS.

To help the plants compete with existing and new vegetation, granular simazine was used for some weed control. A contact herbicide and improvised shield device eliminated grassy weed competition where existing vegetation couldn't be removed mechanically.

"With more than 80 different planting locations scattered over the county and 72,000 plants, we needed a fast, efficient means of getting the donated tracts planted," said Rock Bridges, wildlife biologist with the Iowa Conservation Committee. "We divided the county into four sectors and used a separate tree planter and crew for each area."

Volunteer labor from 4-H clubs, Future Farmers of America chapters, Boy and Girl Scouts, school groups, and civic organizations helped with the plantings. About 150 volunteers helped plant areas that tree-planter crews couldn't reach. The Winnebago County Conservation Board obtained Federal Public Employment Program funds to hire six people. These workers allocated plants, planted, and helped with weed control and watering from April through June.

Dennis Castle, county executive director of the Agricultural Stabilization and Conservation Service, commented that the program takes advantage of odd, idle areas which dot the county.

"By concentrating our planting efforts on those areas that remain principally noncropland today, we can boost the overall wildlife population by giving them a better home," he said. ♦

Pondweed Project

by David W. Patterson
Biologist, SCS, Red Bluff, California

"How can I get rid of the weeds in my ponds?"

That question is probably one of the most frequently asked of the Soil Conservation Service by pond owners.

For Frank Hurd, owner of a fishing resort near Redlands, California, the question was particularly urgent. Pondweeds had reduced fishing access on his ponds for several summers and fishermen at his pay lakes complained about the weedy condition of the ponds and the small size of the bluegills.

A cooperator with the San Geronio Resource Conservation District, Hurd contacted SCS. After discussing several possible solutions, he decided to try the use of fertilizer, a method which has had limited use in California although it is popular in the South.

By fertilizing his ponds, Hurd hoped to establish a bloom of phytoplankton which would shade out the sago pondweed by preventing sunlight from penetrating to the bottom of his ponds.

Hurd selected this method for its availability, relative low cost, and ease of appli-

cation. He decided that a weed mower and the manpower needed to control vegetation mechanically through the summer would be too costly and that aquatic herbicides could be detrimental to the alfalfa hay crop he irrigated with pond water.

With technical assistance from SCS, Hurd fertilized his ponds from March to October and has achieved virtually complete control of the sago pondweed.

The first application was made in March after the morning surface temperature reached 60 degrees. Two hundred pounds of 8-8-4 fertilizer were applied per surface acre of water.

This rate of application was subsequently reduced by half or more after a satisfactory bloom of phytoplankton was established. Applications continued at 2-week intervals to keep visibility to about 20 inches.

In mid-May, an application of 16-20-0 was tried to see if potash could be eliminated and yet maintain a satisfactory bloom in the ponds. This succeeded, and Hurd was able to reduce costs and the use of unnecessary nutrients. ♦

League of Women Voters

States Position on Land Use

The League of Women Voters of the United States, after nearly 3 years of study by local leagues, announced its position statement on land use earlier this year, noting that land ownership, whether public or private, implies responsibilities of stewardship.

"In decisions about land use, public as well as private interests should be respected, with consideration for social, environmental, and economic factors," the national board stated last spring in *The National Voter*, the League's quarterly publication.

"Each level of government must bear appropriate responsibility for planning and managing land resources. It is essential at a minimum that an appropriate level of government determine, regulate, and guide critical activities and the use of critical land areas. To guarantee responsive and responsible governmental decisions, citizen participation must be built into the planning and management of land resources at every step.

"To these ends, the federal government should exert leadership to:

- encourage formulation of land resource goals;
- develop policies and standards for conserving land resources;

- foster coordinated planning and management of land resources by all levels of government;

- foster cooperation among agencies and among levels of government in establishing mechanisms that encourage consideration of all public and private rights and

interests affected by land use decisions;

- minimize conflict of interest on the part of those who make decisions about land resources;

- ensure more effective citizen participation through such measures as adequate funding for citizen information and review." ♦

Outdoor Classrooms on the Outer Banks

Living year-round in a community where people drive hundreds of miles just to enjoy a week or two of vacation, youngsters in North Carolina's fabled Outer Banks are developing an environmental education program to heighten their own appreciation and enjoyment of the area.

Both Kitty Hawk Elementary School and the Cape Hatteras School are cooperators with the Pamlico Soil and Water Conservation District and have been guided in outdoor classroom activities by supervisors of the district and SCS personnel from the Manteo Field Office.

At Kitty Hawk, students decided to improve the school location and constructed walkways, posted nature signs, and are studying freshwater ecology in their manmade pond, ac-

cording to Jesse Newman, chairman of the Dare County Board of Supervisors.

At Cape Hatteras, Mrs. Yancey Foster, first woman supervisor elected in North Carolina, helped start the program. Students have worked to stabilize ground cover on their ball field, with help from SCS, and plan to build and distribute bird houses in the community for purple martins. — David Hardee, conservation technician, SCS, Manteo, North Carolina. ♦

SOIL CONSERVATION Index, Vol. 39 (August 1973 to July 1974). Single copies are available by request from the magazine office in Washington, D.C.

Conservation Tours Attract 3,500 North Dakota Students

Conservation tours for seventh graders are gaining in popularity in North Dakota. Nearly 2,000 students participated in tours in 11 counties last spring, and an estimated 1,500 students will attend tours in 9 more counties this fall.

The tours are a cooperative effort of the local school district, soil conservation district, and businessmen, as well as the Soil Conservation Service, Extension Service, North Dakota Game and Fish Department, U.S. Fish and Wildlife Service, U.S. Forest Service, North Dakota Forest Service, Agricultural Research Service, and Farmers Home Administration.

The programs for the tours vary somewhat but usually include onsite study of soil and its characteristics, viewing of tree plantings, and a discussion of the kinds of plantings and their benefits, and examples, as well as discussion, of the need and advantages of residue management, stripcropping, range management, wildlife management, and other conservation work.

The various schools in a county usually cooperate to put on one conservation tour at a central location.

The tours usually last 3 hours, followed by a lunch provided by the sponsors, and a short quiz.

"Most receive good grades, due to the attentiveness and interest of the students," com-

ments E. R. Umland, SCS forester in Bismarck, North Dakota. ♦



Christmas Trees In Colorado

In eastern Colorado, where the average annual precipitation is only 15 inches, Christmas trees are an unusual crop. When Dick Loos (above) of Sterling, Colorado, decided to market Scotch pine for additional income, he planted the trees in the flat channel terraces to improve moisture conditions. The plantings, started in 1970, have been successful, and Loos will be marketing 400 of his 1,200 Scotch pine trees for the first time this Christmas season. A cooperator with the South Platte Soil Conservation District, Loos has his 160-acre farm completely terraced. A windbreak of some 5,000 trees surrounds his farmstead. A part-time farmer, Loos teaches German at Sterling High School. ♦

Bird Booklets

Two new SCS booklets in the "Invite Birds to Your Home" series have been published for the Northwest and the Southeast.

"Invite Birds to Your Home — Conservation Plants for the Southeast" (PA-1093) was written by Olan W. Dillon, Jr., biologist in the SCS South Technical Service Center in Fort Worth, Texas, and covers the Southeast from the Carolinas to Florida and west to eastern Oklahoma and Texas.

"Invite Birds to Your Home — Conservation Plantings for the Northwest" (PA-1094) was written by L. Dean Marriage, biologist in the SCS West Technical Service Center in Portland, Oregon, and covers Washington, Oregon, and California north of San Francisco.

Each color booklet contains a chart on plants preferred by familiar birds in the region as well as detailed information on plantings and landscape designs to attract songbirds.

Individual copies are available from local SCS offices in the specific region covered by the pamphlet. Additional copies are available from the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402, at 75 cents a copy.

Booklets in the series were published earlier for the Midwest and the Northeast. ♦

Soil surveys

California

Nevada County Area. By Lynn A. Brittan. 1975. Soil Conservation Service and Forest Service in cooperation with University of California Agricultural Experiment Station. 105 pp., illus.; maps.

Colorado

Gunnison Area (Parts of Gunnison, Hinsdale, and Saguache Counties). By William R. Hunter and Clayton F. Spears. 1975. Soil Conservation Service in cooperation with Colorado Agricultural Experiment Station. 85 pp., illus.; maps.

Illinois

Pope, Hardin, and Massac Counties. By Walter D. Parks. 1975. Soil Conservation Service and Forest Service in cooperation with Illinois Agricultural Experiment Station. 126 pp., illus.; maps.

Indiana

Crawford County. By Robert C. Wingard, Jr. 1975. Soil Conservation Service and Forest Service in cooperation with Purdue University Agricultural Experiment Station. 60 pp., illus.; maps.

Mississippi

Harrison County. By William I. Smith. 1975. Soil Conservation Service and Forest Service in cooperation with Mississippi Agricultural and Forestry Experiment Station. 80 pp., illus.; maps.

Missouri

Scotland County. By F. C. Watson. 1975. Soil Conservation Service in cooperation with Missouri Agricultural Experiment Station. 45 pp., illus.; maps.

North Dakota

Bowman County. By Donald D. Opdahl, William F. Freymiller, Lawrence P. Haugan, Richard J. Kukowski, Bertram C. Baker, and Joseph G. Stevens. 1975. Soil Conservation Service in cooperation with North Dakota Agricultural Experiment Station. 140 pp., illus.; maps.

Oklahoma

Mayes County. By Dock J. Polone, Claude T. Newland, and Bill G. Swafford. 1975. Soil Conservation Service in cooperation with Oklahoma Agricultural Experiment Station. 92 pp., illus.; maps.

Meetings

Tennessee

Montgomery County. By Eugene T. Lampley, John B. Cothran, Lincoln E. Davis, Robert B. Hinton, Olin L. North, and Paul T. Steele. 1975. Soil Conservation Service in cooperation with Tennessee Agricultural Experiment Station. 63 pp., illus.; maps.

Texas

Panola County. By Raymond Dolezel. 1975. Soil Conservation Service in cooperation with Texas Agricultural Experiment Station. 55 pp., illus.; maps.

Sherman County. By Billy R. Stringer. 1975. Soil Conservation Service in cooperation with Texas Agricultural Experiment Station. 42 pp., illus.; maps.

Utah

Box Elder County (Eastern Part). By Raymond S. Chadwick, Marvin L. Barney, Delyle Beckstrand, Ludene Campbell, James A. Carley, Earl H. Jensen, Calvin R. McKinlay, Sherman S. Stock, and Howard A. Stokes. 1975. Soil Conservation Service and United States Department of the Interior, Fish and Wildlife Service, Bureau of Land Management, in cooperation with Utah Agricultural Experiment Station, 223 pp., illus.; maps.

November

- 2-5** *Sprinkler Irrigation Association, Scottsdale, Ariz.*
- 3-7** *American Society of Civil Engineers Convention, Denver, Colo.*
- 4** *American Seed Trade Association Farm Seed Conference, Kansas City, Mo.*
- 9-14** *National Water Resources Association, Honolulu, Hawaii*
- 10-18** *National Grange, Columbus, Ohio*
- 11-14** *Future Farmers of America, Kansas City, Mo.*
- 12-13** *Fourteenth Annual Purdue Air Quality Conference, Indianapolis, Ind.*
- 16-19** *American Bankers Association, National Agricultural and Rural Affairs Conference, Houston, Tex.*
- 16-20** *American Institute of Chemical Engineers, Los Angeles, Calif.*
- 17-20** *American Association of State Highway Officials, St. Louis, Mo.*
- 30-**
- Dec. 2** *American Society of Farm Managers and Rural Appraisers, Inc., Dallas, Tex.*

December

- 2-5** *Western Forestry Conference, Vancouver, British Columbia*
- 3-5** *Twenty-second Annual Meeting Keep America Beautiful, Inc., Washington, D.C.*
- 4-5** *National Association of Manufacturers, New York, N.Y.*
- 8-12** *American Geophysical Union, San Francisco, Calif.*
- 9-11** *American Seed Trade Association Corn & Sorghum Industry Research Conference, Chicago, Ill.*
- 11-12** *American Seed Trade Association Soybean Research Conference, Chicago, Ill.*
- 12-17** *Second World Congress on Water Resources, New Delhi, India*
- 15-18** *American Society of Agricultural Engineers, Chicago, Ill.*
- 28-30** *Joint Meetings—American Agricultural Economics Association and American Economic Association, Dallas, Tex.*

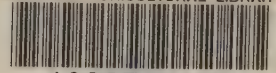
January 1976

- 13-17** *American Seed Trade Association Garden Seed Conference, San Francisco, Calif.*
- 14-15** *National Council of Farm Cooperatives, Washington, D.C.*
- 19-22** *National Wool Growers Association, Wichita, Kans.*
- 19-22** *North American Game Breeders and Shooting Preserve Association Convention, Milwaukee, Wisc.*
- 27-30** *American National Cattlemen's Association, Phoenix, Ariz.*

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U.S. Department of Agriculture / Soil Conservation Service / December 1975



Identifying Prime Farmland

The Soil Conservation Service now has a written policy concerning some of the most important resources in the nation—prime and unique farmlands.

In recent years, special interest groups have called for the recognition of the importance of wetlands and recreational lands and hunting and fishing lands. Farmers and rural landowners feel that prime and unique farmlands are just as important—even more important—in sustaining the quality of our life.

In the SCS policy memorandum (LIM-3) we define prime farmland as land suited for producing food, feed, forage, fiber, and oilseed crops, and also available for these uses. The land could be cropland, pastureland, rangeland, or forest land. It has the soil quality, growing season, and moisture supply needed to produce sustained high yields of crops economically when treated and managed with modern farming methods.

These prime lands can be farmed continuously or nearly continuously without degrading the environment . . . they will produce the most with the least amount of energy . . . they are the most responsive to management and require the least investment for maintaining productivity.

Unique farmland is land, other than prime farmland, that is used for the production of specific high-value food and fiber crops. It has the special combination of soil quality, location, growing season, and moisture supply needed to produce sustained high quality and/or yields of a specific crop when treated and managed according to modern

farming methods. Such crops include citrus, olives, cranberries, fruit, and vegetables.

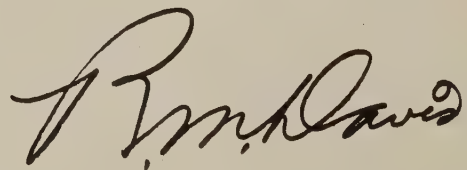
The policy memorandum spells out the soil characteristics and other physical criteria which the Service will now use to conduct a national inventory of prime and unique farmlands. By interpreting information in soil surveys in light of these physical criteria, we can identify and inventory the nation's most productive farmlands in a reasonable time.

We are conducting the inventory in cooperation with other interested agencies at the national, state, and local levels of government. Many of these agencies have worked closely with us to develop definitions so that the inventory will be uniform throughout the nation.

We are also initiating a monitoring system to reflect significant changes in the use of prime and unique farmlands. This, too, will help us monitor the productive capacity of American agriculture in the years ahead.

Under no circumstances will the inventories constitute a designation of any land area to a specific use, nor advocate such. Such designations are the prerogative of responsible officials of concerned local and state government agencies.

Now, those concerned with the preservation of prime and unique farmlands will have additional and better information on which to base judgments that will help preserve, protect, and improve these lands—the best producing lands in the United States.





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Earl L. Butz
Secretary of Agriculture

R. M. Davis, Administrator
Soil Conservation Service

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Contents

- 2 From the Administrator
- 4 Floating Islands for Waterfowl in Arizona
Leon F. Fager and John C. York
- 6 New Upper Colorado Plant Center
Focuses on Native Plants for Reclamation
M. D. Burdick
- 8 Garden at Hanalei
Phyllis Charles
- 10 Conservation Blossoms on 'Flower Farm'
William Westrate
- 11 Title X Funds in Archuleta County
William L. Hill
- 12 Student Trainees in SCS
Manly C. Wilder
- 16 Stabilizing Stockpiles on the Texas Coast
Kenneth L. Cash and Thomas P. Smith II
- 18 Trailblazing in Tennessee for Outdoor Teaching
James H. Eldridge
- 20 A Fishing Trip 'Hooks' into Conservation
Roger D. Rayburn and Willis J. Ridenour
- 23 Soil Surveys
- 23 Meetings

COVER: A harvest of barley attracted a photographer to this contoured field in the Fairfield Soil and Water Conservation District in South Carolina. More than 40 years ago, Fairfield County, then planted mostly in cotton, was described as one of the most eroded areas in America by Hugh Hammond Bennett, first chief of the Soil Conservation Service.

Floating Islands For Waterfowl In Arizona

by **Leon F. Fager and John C. York**
Biologist, SCS, Flagstaff and Phoenix, Arizona



Providing shore birds and waterfowl a safe spot to rest or nest on small stock ponds in the arid southwest has been a problem that's largely gone unsolved.

Open water is so scarce in Arizona that waterfowl are attracted to such ponds, but livestock grazing usually has eliminated shoreline cover. Landowners usually have few choices if they want to protect waterfowl from predators. They can build an earthen island, which takes up valuable area in an existing pool, or put up fencing, which is costly and requires watering lanes or offsite troughs for livestock.

We recently developed a "floating island" that is showing considerable promise in providing needed protection and nesting cover for these birds. Last summer, we put nine "floating islands" on ponds in northern Arizona and have found their use and the growth of vegetation on them exceeding our expectations.

The islands are made from Styrofoam and planted with vegetation from the pond site. Holes are drilled through the Styrofoam so that water seeps into the rooting zone of the plants, maintaining them in a manner similar to hydroponic culture. Each island has a covered nesting enclosure and an open "loafing" area.

Initially, the islands were made from sheet Styrofoam cut and glued together to make

Coauthor Leon Fager and summer aide Jesse Benta lace bulrush through the nest cover and plant vegetation on one of the "floating islands" designed for waterfowl.

Once completed, the islands are anchored in the pond with a rock. A stabilizer keeps them from being whipped around.



4-inch-thick platforms, either 4 feet square or 4 by 8 feet. To make a nesting square, we cut a 2-foot square of Styrofoam 2 inches thick and glued it to the center of the island. We placed a shaped cover of chicken wire over the square, laced willow or bulrush through the wire, and put dried grass in the nesting enclosure.

To make a rooting zone for plants, we cut a channel around the island 3 inches deep, 8 inches wide, and 1 inch from the outside edges. We drilled 1/2-inch holes through the bottom of the channel to allow water to seep in and keep the root systems wet. We then placed soil and vegetation from the pond site into the channels. The growth of plants in these channels has greatly exceeded expectations. Adapted plants are right at hand around the pond edge and the possibilities for landscaping the islands are limitless.

Sheet Styrofoam is relatively expensive. We solved that problem when we discovered that some motorcycles are shipped in large Styrofoam boxes that can be recycled into ideal islands 4 feet by 6 feet by 8 inches. These boxes have many grooves, depressions and indentations so that cutting channels isn't necessary. We simply drill holes in the bot-

toms of the depressions and plant. Motorcycle dealers have been very helpful in supplying boxes for this project.

We put the first of the islands in White Mountain Hereford Ranch's lake near Springerville last July. We put out eight more in privately owned stock ponds near Springerville, and this fall we've placed islands in other areas in the state.

We've sighted pintails, cinnamon teal, coots, mallards, and shore birds using the islands. We put the islands out a little late in the season for nesting. We've also observed that fathead minnows spawn on the underside of the islands and that the islands are used for part of the life cycle of many aquatic insects.

We encountered the problem of coots pecking holes in the original island, which was painted with a hard-curing epoxy. Now we've eliminated that problem by framing the islands with 8-inch-wide bark-out pine.

We've made improvements, almost daily, as we gain experience.

To keep the lightweight

islands from whipping around in the wind, we attached a stabilizer on the anchor rope. The stabilizer is 24 inches square and is spliced into the rope 3 feet from the island. The island is anchored with a single rope attached to a 25- to 30-pound rock. To date, wind damage has not been a problem.

This winter, we will leave a few islands in the ponds so we can check on ice and snow damage. With the light weight of the islands, it will be easy to pick them up for winter storage if this proves necessary.

Many Arizonans have expressed interest in the project. Requests for the islands are coming into SCS offices in northern Arizona, and both the Natural Resources Conservation Districts and the Arizona Wildlife Federation are considering sponsoring a program to put in "An Island Per Pond" in this area where open water is so scarce.

The islands don't fill all of the habitat requirements of waterfowl. They do provide essential protection and nesting cover in an area where both are lacking. ♦

New Upper Colorado Plant Center Focuses on Native Plants for Reclamation

by M. D. Burdick

State conservationist, SCS, Denver, Colorado

The rapid development of fossil fuel resources in the Upper Colorado River Basin has brought into new focus the need for special plants to solve reclamation problems.

As a result, two soil conservation districts in Colorado have established the Upper Colorado Environmental Plant Center near Meeker to develop native plant varieties and assure their commercial availability for reclamation of mined areas.

At the present time, seed sources for major plant species indigenous to the region are sorely lacking. Many of the dominant plants have never been adequately tested or de-

veloped for commercial production.

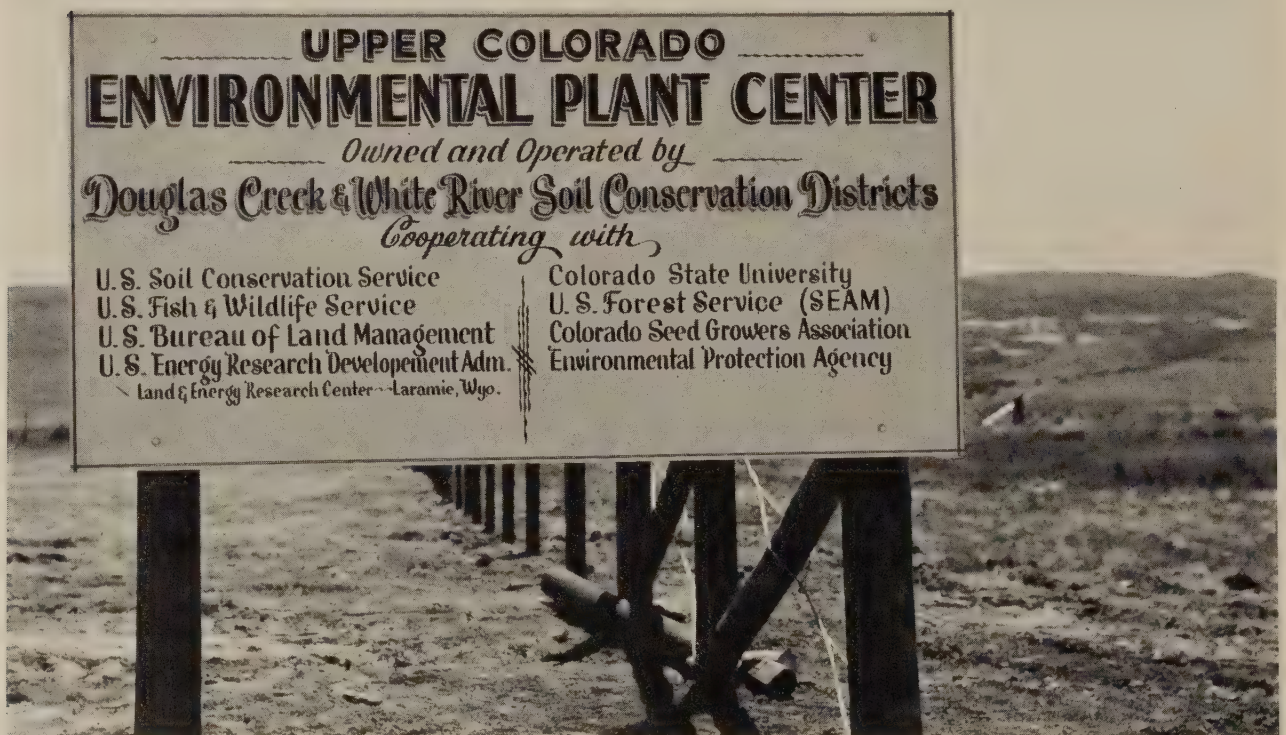
The two districts—Douglas Creek and White River Soil Conservation Districts—are setting up the center with specialized technical assistance from the Soil Conservation Service, which operates or cooperates in the operation of 21 other plant materials centers around the country.

The districts acquired 189 acres of prime agricultural land for the center and began construction of the basic facilities last spring. This past summer, a crash program was initiated to collect seeds for testing and evaluation next spring.

An experienced SCS center manager has been assigned full time to the Upper Colorado Environmental Plant Center by SCS and funds for the project have been provided by the Soil Conservation Service, U.S. Fish and Wildlife Service, Bureau of Land Management, U.S. Forest Service, and the Energy Research and Development Agency, all of which have an interest in land improvement and restoration. Private industry has also provided financial support.

The need for accelerated testing and development of special plants to meet projected needs in the Upper Colorado region has been recognized for several

Construction on the Upper Colorado Environmental Plant Center near Meeker, Colorado, began last spring.



years by industry and the government agencies charged with land management responsibilities. The anticipated mining of vast areas of oil shale and coal reserves in the region, which includes western Colorado, eastern Utah, and southern Wyoming, could drastically disturb thousands of acres of unique land forms and ecosystems.

Last February, SCS completed an analysis of its plant materials assistance capabilities from existing centers. This study verified what was already suspected—that present plant materials centers are not located to adequately serve the Upper Colorado region.

The closest centers—at Los Lunas, New Mexico, Bridger, Montana, and Aberdeen, Idaho, are more than 300 miles from the center of the developing coal and oil shale industries in western Colorado. None of these centers is within the major land resource areas of the Upper Colorado Basin.

Early in 1974, SCS had begun exploring the options available for establishing a new plant ma-



The new center will develop native plant varieties for use in reclamation of land mined for oil shale and coal in the Upper Colorado region.

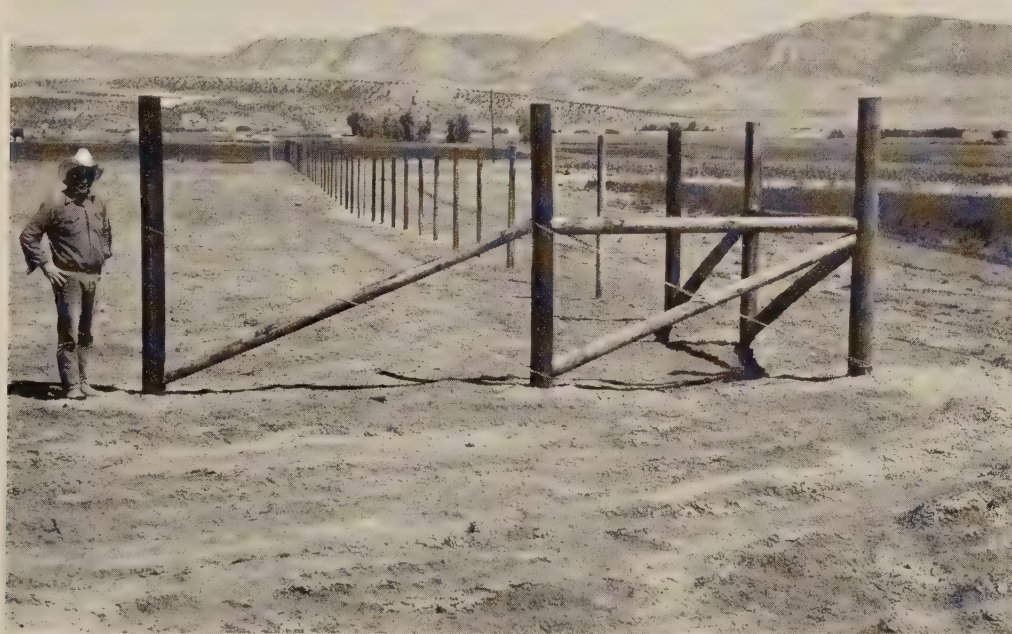
terials center. These ranged from seeking Congressional authorization for a 100-percent federal facility to establishing a cooperative agreement with local soil conservation districts with funding from several sources. To meet the urgent need, the cooperative route proved most feasible.

In addition to cooperation with federal agencies, the districts are also entering into cooperative agreements with Colorado State University and the Colorado Experiment Station to use their desert station at Fruita and facilities near Durango.

An advisory council is being organized to assist the districts in determining needs and priorities in project development. The council will be composed of representatives of federal and state agencies, universities, private industry, and others having needs related to plant materials development in the Upper Colorado region.

The need for commercial sources of native plants is evident in environmental restoration to return the land to natural plant communities vital to wildlife, seasonal grazing use, and acceptable esthetic levels. The purpose of the center is to develop such varieties and assure their commercial availability to those charged with reclamation of disturbed lands. ♦

An 8-foot fence was one of the first major jobs at the 189-acre center. The fence is necessary to keep out the many deer in the area.





Kindergarten students at Kauai's Hanalei Elementary School harvest their first radish crop.

Garden at Hanalei

by Phyllis Charles

Information specialist, SCS, Honolulu, Hawaii

Gardening? It's the growing thing at the rural Hanalei Elementary School on Kauai, the "Garden Island" of the Hawaiian chain.

Students call their garden at the school "The Farm," and the hands-on project complements indoor classes on soil, plants, and water and wind erosion.

The school garden started when the school principal, Nick Beck, recognized that the students, even though born and raised in a rural community, lacked personal experience with soils and plants just as their urban cousins did.

Beck serves on the board of directors of the East Kauai Soil

and Water Conservation District, and he turned to the district for money and moral support and to the SCS district conservationist for technical help to enrich his students' "earthly" experiences.

The district conservationist, John Smithhisler, worked with the science teacher on basic

material presented in class. Teachers of all the grades, kindergarten through sixth, were encouraged to get their students involved with the garden in the science class periods. The teachers did the basic layout of the garden plot.

The older boys, using hand tools supplied by the soil and water conservation district, cleared a lushly overgrown corner of the schoolyard. The 75-foot-square plot marked out for the garden took a lot of "kalai" (hoe) "hana" (work) from the fourth and fifth graders.

Each grade level had its own section and made the decisions on what to plant. The kinder-

garten children decided to plant radishes and other rapid growing vegetables. Some of the lower grades chose bush beans, peas, and beets. The older students were willing to wait a bit longer for their crops and selected tomatoes, corn, soybeans, cabbage, and Chinese cabbage for their sections.

The garden provided a reason to consider safety in the use of tools and the proper care of equipment. Arithmetic and spelling seemed more palatable too when used for record keeping of garden activities.

In all this, the district directors let the students know they

were interested in the garden and the gardeners. The SCS staff made occasional "farm visits" to check on progress and, when necessary, made suggestions.

When the first corn planting didn't do well, students received such suggestions as, "This hybrid corn is especially adapted to grow in Hawaii, why not try it instead," or "Try irrigating this section every other day."

Some students who had never had this exposure to nature have become so interested in the growing process that they have developed their own garden plots at home. ♦

Fourth-grade students learn proper care of tools and safety in handling them while establishing and working in the school garden.



Conservation Blossoms On 'Flower Farm'

by William Westrate

Former district conservationist,* SCS, St. Joseph, Michigan

What could the Soil Conservation Service do to help a "flower farmer"?

Peter DeGroot, one of the world's largest dahlia growers, contacted SCS for help several years ago on a wind erosion problem on his farm near Coloma, Michigan.

"Soil was blowing across the road so bad, drivers had to turn on their headlights to get by," DeGroot explained.

DeGroot farms 300 acres and ships about \$1.5 million worth of bulbs and plants a year to wholesalers, discount stores, lawn and garden stores, and mail order houses in the United States and Canada. In addition to dahlias, he produces gladiolus, cannas, peonies, and other flowers, as well as rhubarb, asparagus, chives, and horseradish.

Due to the specialized nature of his crops, cover crops won't work in all situations. There also isn't enough snow for a good winter cover on his farm in the south of the state near Lake Michigan.

With technical assistance from SCS, DeGroot planted six



PETER DeGROOT

single row windbreaks to control wind erosion, spacing the trees 10 feet apart in the row with 800 feet between rows.

The tree selected was Simon poplar, suggested by SCS for its quick growth and potential as a conservation planting. Although the trees are relatively short-lived, DeGroot is satisfied with them because of rapid growth—as much as 8 to 10 feet in 1 year—and the protection they provide.

Continually upgrading his operations to make the best use of his resources, DeGroot finds soils information particularly valuable. He makes use of sludge or treated domestic sewage on his farm, uses cover cropping, and plows under "green manure."

"The SCS has an open invitation to help with conservation practices on my farm," says this "flower farmer" who immigrated to the United States from Holland in 1950.

He is a cooperator with the St. Joseph River Soil Conservation District and this year was selected by the district as the runnerup "Conservation Farmer of the Year."

Reared in the bulb and plant business, DeGroot said he settled in the Coloma area because of its climate, geography, and special labor available. During peak periods, he employs 80 persons.

DeGroot uses highly specialized equipment on his farm and is planning to use computers in his planting and growing operations. He has a computer which he uses now for accounts, payroll, and inventory control. ♦

*Mr. Westrate retired in April 1975.

Title X Funds in Archuleta County

by William L. Hill

District conservationist, SCS, Pagosa Springs, Colorado

Last July, the U.S. Department of Commerce made \$10.5 million available to the Soil Conservation Service under Title X, the Job Opportunities Program authorized under the Emergency Jobs and Unemployment Assistance Act of 1974.

This money was to pass through SCS to conservation districts in areas of high unemployment and the districts were to hire the unemployed in conservation work. The San Juan Soil Conservation District in Archuleta County in southwest Colorado is one of those districts to receive Title X funds.



A soil conservation district employee, hired with Title X funds, learns to use surveying equipment in Archuleta County, Colorado.

In April of 1975, Archuleta County in Colorado had an unemployment rate of 17.3 percent. Welfare rolls had swelled to an all-time high. Unpaid bills stacked up and Pagosa Springs was the scene of continual unrest.

About that time the Soil Conservation Service was asked to identify conservation projects where people could be hired to accelerate the work.

Traditionally, the Soil Conservation Service and local soil conservation districts have been concerned about how natural resources are managed. People are also a natural resource and, if unemployed, their talents, skills, and abilities are wasted.

SCS worked with the San Juan Soil Conservation District as the district identified several resource conservation and development measures where in-

dividuals could be employed and complete needed work. The plans met criteria in Title X requiring that 75 percent of the money must go for salaries and only 25 percent could be used for materials and administration.

In July of 1975, the U.S. Department of Commerce funneled funds through SCS to the local soil conservation district to hire the unemployed.

The San Juan District received \$613,500 and promptly hired 61 employees. District work crews tackled gully stabilization projects in the Valle Seco drainage.

The Archuleta County Airport is being topographically mapped by Title X crews for the county planner so he might accurately plan future airport growth including planning for

wind and water erosion control. Two miles of fence were repaired by district personnel along the runway to protect areas and vegetation that stabilize the soil.

Downtown Pagosa Springs is getting a facelift while crews plant trees, riprap a steep slope with native rock, and improve a parking area.

Williams Creek Reservoir will also receive extensive changes, including a new boat ramp, fencing, and expansion of present recreation facilities.

Not only have many physical changes taken place, but employees hired under Title X found that their skills, talents, or abilities were necessary to get the job done. In fact, four of the Title X employees have found that their newly learned skills qualified them for placement with a new employer. ♦

Student Trainees In SCS

by Manly C. Wilder

Personnel Division, SCS, Washington, D.C.

Looking back on a summer with the Soil Conservation Service, one student trainee recalled the "chiggers, ticks, sunburn, chewing tobacco, animal waste system investigations on the hottest, stickiest day of the month, and survey notes that refused to check."

Then she added that she's "smiling about all of it" and feels the field experience she gained was invaluable.

That student — Melcy C. Curth of Purdue University—is one of 428 college students hired as student trainees by the Soil Conservation Service last summer.

These trainees provide a major source of professional employees for the Service. Once embarked on the training program during their freshman, sophomore, or junior years in college, they have career-conditional appointments and may join the Service full time upon graduation.

SCS has hired more than 6,000 students under the federal government's student trainee program during the last 15 years. It is the largest participant in the program in USDA and one of the largest in the federal government. The program is designed to attract high-quality students to help meet the long-range recruitment needs for professional employees. The work-study program gives trainees a chance to participate in SCS work and affords SCS the opportunity to evaluate the student's performance in a work situation. More than half of the trainees hired by SCS remain on as permanent, full-time employees.

Recruited through on-campus visits by SCS personnel at nearly 100 colleges and universities, the students are usually enrolled in agriculture, soil conservation, soils, agronomy, forestry, wildlife biology, or engineering. They are most often employed as soil conservationists, soil scientists, and civil or agricultural engineers.



Student trainees Alberto Garcia, Jr., and Tom

Some also are employed as range conservationists and geologists.

Student trainees qualify in a civil service examination usually at the GS-3 or GS-4 level. They work during the summer, go on leave in the fall and return to school.



esa Cearley discuss range management with Melvin Bruns, range manager, U.S. Army Camp Bullis in Texas.

Assigned to work in a field office, they serve as a helper to a professional soil conservationist, soil scientist, range conservationist, or engineer. Through a comprehensive written training plan, the students not only learn the principles of conservation planning but how

to install conservation practices. They work in the field and become familiar with soils, plants, aerial photography, woodland, wildlife, and surveying. Above all, they are taught that they are part of a technical action team which provides professional guidance to land-

owners and operators and local leaders in soil and water conservation.

The student trainee program is an integral part of SCS operations and receives strong support throughout the Service. Among its strongest advocates is Clete Gillman, SCS state con-

servationist in Indiana and one of nine state conservationists who are former student trainees. Gillman said he feels the

program is an outstanding method of securing quality employees, and that the student trainee who stays with SCS is

more ready for a professional position and can move more readily into positions of responsibility.



At left, SCS Range Conservationist Louis Cervantez instructs student trainees Martha Diehl and Jim Vancura in the use of an increment borer near Provo, Utah. Below, John Arnn (center), SCS state resource conservationist in Texas, discusses grass characteristics with four student trainees in Texas—Anthony W. Edison, Larry A. Jernigan, John L. Freeman, and Lawrence W. Fryer.



The program has given thousands of students an opportunity to apply their academic training in on-the-job situations. With work related to their studies, students can bring their training to the field and take their field experience back to the classroom.

In addition, the program strengthens the Soil Conservation Service. Students are inquisitive and question the traditional way of doing things. They generally raise questions that cause us in the Service to think more about what we are doing and why—and to take a fresh look at our own operations. ♦

Among the more than 400 SCS student trainees last summer, Sharon K. Schafer (at right) worked as a soil conservationist in Vancouver, Washington; Dan L. Boenig did similar work from the SCS office in Seguin, Texas; and Melcy Curth (below, at right) worked as an engineer trainee at the Vincennes, Indiana, area office.

Boenig, who attends Texas A&M University, is a former national president of the student chapter of the American Society of Agronomy.



Stabilizing Stockpiles on the Texas Coast

by **Kenneth L. Cash and Thomas P. Smith II**

District conservationist and soil conservationist, SCS, Sinton, Texas

On extremely windy days not long ago, red clouds would hover over the Texas Gulf Coast towns of Gregory and Ingleside, reminiscent of a sand storm during the Dust Bowl days. The water of nearby Corpus Christi Bay would turn a reddish tint.

The "culprit" was soil containing bauxite ore, stockpiled in five huge, barren mounds near the coast. Owned by the U.S. Government, the soil is imported from Jamaica and stockpiled near the coast until needed in supplying aluminum for defense purposes. In its native state, it is fairly productive with the high rainfall of Jamaica, despite a poor plant-soil-moisture relationship.

Stockpiled in Texas in mounds up to 70 feet high, however, the bauxite was extremely susceptible to wind and water erosion. The fine, powder-like bauxite, aided by heavy fall rains and brisk gulf breezes, was eroding into the bay and nearby towns.

As a result of cooperation between government agencies, a manufacturing company, and a soil and water conservation district, however, the stockpiles have been stabilized—

and natural resources protected.

It began in 1973, when two representatives from the General Services Administration (GSA), which manages the stockpile for the federal government, contacted the Soil Conservation Service for assistance in stabilizing the 80 acres of Jamaican soil.

The two men, Lyle Lovelace and Doyle Reeves from GSA's Property Management Division, discussed alternatives with SCS and decided that the most economical and long-term solution would be to vegetate the piles.

In cooperation with the San Patricio Soil and Water Conservation District, SCS plant materials specialists developed a vegetative stabilization plan for the project. The plan included preparing a seedbed by shaping the eroded slopes with a dragline and harrow; discing and harrowing the tops with a tractor; applying wood fiber mulch at the rate of 2,000 pounds per acre; fertilizing; and seeding a mixture of seven grass species — selection 75 Kleingrass, buffelgrass, King Ranch bluestem, Medio bluestem, buffalograss, NK-37 ber-

mudagrass and common bermudagrass.

The seed, fertilizer, mulch, and water were mixed into a slurry and sprayed on with a hydromulcher. A sprinkler irrigation system was installed to help establish the grasses. This was needed because of the droughty characteristics of the extremely porous bauxite. Reynolds Metal Company, which owns the land on which the bauxite is stored, supplied pipe, pump, water, and labor to irrigate the piles.

SCS engineers developed a plan to intercept runoff and divert it into holding ponds. The runoff water will be recycled and used by Reynolds for industrial purposes. GSA obtained contractors to do the vegetative and construction installation.

The system of diversions was completed in late 1974, and the final seeding was completed in the spring of 1975. The tops of the piles are now lush with knee-high grasses and the slopes are making excellent progress.

The red tint has now left Corpus Christi Bay and the skies are clear once more. ♦

Slopes of stockpiled bauxite were shaped to smooth rills and prepare the seedbed.



Mulch, seed, and fertilizer were applied to the slopes with a hydromulcher.

Author Thomas P. Smith II examines the grass established on top of a stockpile.



Trailblazing in Tennessee For Outdoor Teaching

by James H. Eldridge

District conservationist, SCS, Jonesboro, Tennessee

Nearly every school day, children use the outdoors for study at Temple Hill Elementary School in the foothills of the Unaka Mountains in eastern Tennessee.

Their outdoor laboratory, in a densely wooded corner of the school's 5 acres, includes a nature trail along a mountain stream, a "classroom" under a huge hemlock tree, and an area developed for wildlife. The children and teachers have done most of the work on this project themselves.

"We gained the concept for our outdoor study area during in-service training last year when the Soil Conservation Service presented a program on using the outdoors for teaching conservation of natural resources," said the school principal, Robert Howell.

"It was during our first staff meeting that Mrs. Kate Edwards, fourth grade teacher, proposed developing our school ground for outdoor teaching as suggested during the in-service session," Howell continued.

To begin the project, Howell contacted the SCS district conservationist to inventory resources on the school grounds

and help identify and evaluate potential uses. The school has an enrollment of 200 in the town of Erwin.

Once the inventory was completed, Howell appointed a committee of teachers and students to work with the district conservationist to develop a master plan. The plan was to facilitate using the grounds for teaching and to recommend treatment for problem areas, such as barren, eroding places on the playground.

Once the plan was completed, the students were anxious to get started and decided to develop the nature trail first.

They "blazed" the trail, just like Daniel Boone, who had hunted in this area—except that the students used marking tape instead of a knife or an ax. The kindergarten students let their imaginations run rampant, with visions of Boone killing a bear "on this very spot."

Everyone got into the act in helping "pave" the trail with wood chips and bark donated by a nearby sawmill.

Next, students cleared off their outdoor classroom site at the end of the trail. The site is

secluded, with towering trees for a roof, bushes and wild honeysuckle vines for walls, and a carpet of pine needles for the floor. What to use for seating had yet to be decided when someone spotted large waterworn stones along the nearby streambank and suggested them. Everyone liked the idea because the stones blended so well with the natural environment. Eighth-grade boys placed them in semicircular rows for a neat seating arrangement.

By the time the students and teachers tackled the problem areas, enthusiasm for the project was at fever pitch.

Members of the Parent Teachers Association donated equipment to reestablish a dense green sod on the eroded playground. Students raked the soil, broadcast fertilizer and seed, and completed the job with a protective covering of mulch. Flowers, shrubs, and trees are also planned for this area.

On a bank behind the school, students planted white pine trees for erosion control and beautification.

In the area selected for the development of wildlife habi-

tat, students planted 50 autumn olive for winter food for songbirds. Other plantings, such as bicolor lespedeza, are planned to establish food and cover for songbirds and small animals.

Students have shown a tremendous amount of pride in their accomplishments on the school ground, Howell said. Hardly a day goes by without a group using the area to supplement and extend classroom activities.

For example, in language arts, students write poems and stories about the outdoors, learn new words and their meanings, and record observations in a field notebook.

In math, students study shapes and patterns in nature. Concepts of diameter, circumference, and radius come alive as trees are measured, and an

acre is no longer an intangible term after it is measured and staked off.

In social studies, boredom vanishes as students explore local geography—hills, valleys, watersheds, and streams. Students make and interpret maps, study land use, measure climatic variations in relation to slope, exposure, and vegetative cover, and record such factors as precipitation, temperature, and wind direction.

Science also comes alive as excited students learn interrelationships of plants, animals, and man. They search for animal tracks, catch crayfish, periwinkles, and salamanders; identify trees, plants, and wildflowers; study soil formation, soil texture, acidity, and water absorption; and examine rocks for color composition, hard-

ness, and origin.

The children also enjoy an enriched study of art and music outdoors. They paint and sketch with natural colors made from berries, charcoal, rocks, and leaves. They make collages and mosaics from natural materials and weave with grass and reeds. They write songs and record sounds of birds, stream, wind, and trees.

Few schools perhaps have resources for outdoor teaching that compare with Temple Hill, but no school ground is without air, wind, sunlight, pollution, a plot of soil, a few blades of grass, or bacteria. As interest grows in an outdoor classroom, as one starts with what is available, the school ground can be developed and improved as an outdoor laboratory. The kids will love it and so will you. ♦

Searching for periwinkles in a nearby mountain stream stirs up excitement among fourth grade students at Temple Hill Elementary School in Tennessee.



A Fishing Trip

'Hooks' into Conservation

by Roger D. Rayburn* and Willis J. Ridenour

Assistant manager, National Plant Materials Center, SCS, Beltsville, Maryland, and project coordinator, Little Kanawha Resource Conservation and Development Project, Parkersburg, West Virginia



It's been said that a frustrated fisherman will go to any lengths to get his story out.

So when two fishermen in West Virginia's North Fork of the Hughes River found it "running brown," and no muskie or bass on their lines, they traced the source of the silt and did something about it that's resulted in stepped-up erosion control efforts in the watershed.

The two men, Charlie Wilson and Ken Greene, both from Parkersburg, West Virginia, canoed upstream during that fishing trip several years ago to look for causes of the muddy water. They discovered silt coming from five old railroad tunnels which the Baltimore and Ohio Railroad (B&O) had recently "daylighted" to put the tracks in the open and decrease maintenance costs.

Both men are members of the Wildlife Recreation Committee of the Little Kanawha Resource Conservation and Development Project (RC&D), and they brought up the siltation problem at a committee meeting when they returned home.

The committee members decided to bring the erosion problem from the "daylighting" to the attention of the railroad.

B&O officials readily agreed to revegetate the bare soil and contacted the Little Kanawha Soil Conservation District for

* Formerly district conservationist, Harrisville, West Virginia.

On a fishing trip several years ago, Charles Wilson and Ken Greene paddled upstream in the North Fork of the Hughes River in western West Virginia to find out why the water was "running brown."

assistance. The local SCS district conservationist at that time, Shelby VanScoy, prepared a revegetation plan for the five daylighted tunnels.

B&O hired the district's work crew to seed 20 acres in Kentucky 31 tall fescue and plant 15 acres in locust trees and white pines. The railroad added 1,400 autumn olive shrubs for wildlife food and cover as well as erosion control and paid all revegetation costs.

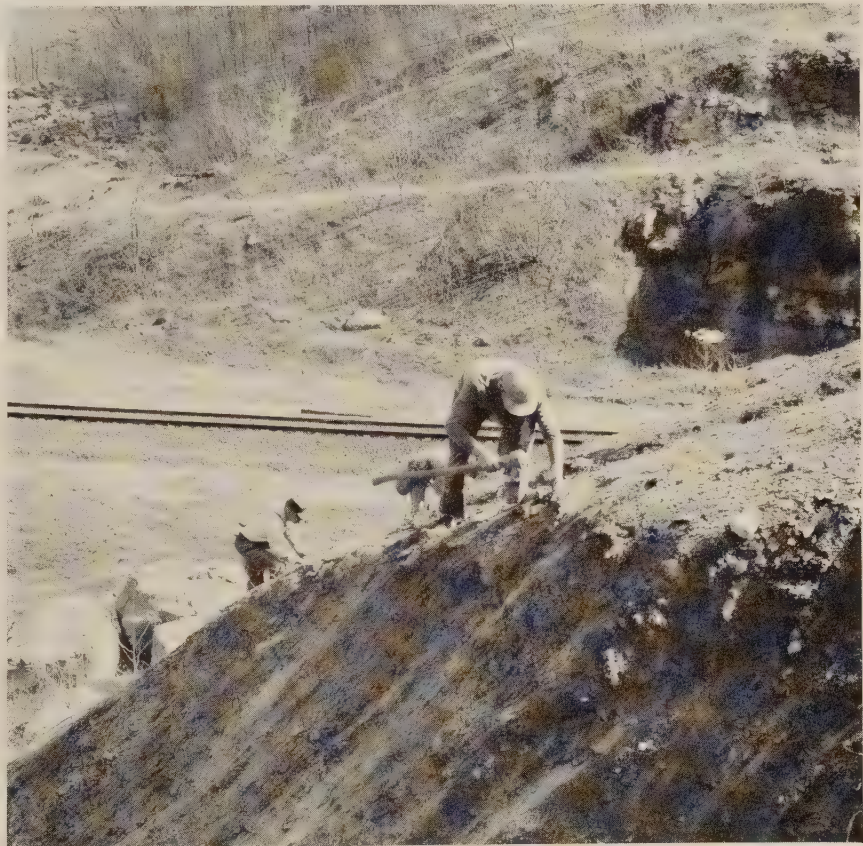
In May 1973, 2 months after the seeding and planting began, all parties involved in the measure toured the area and found grass coming up and trees coming to life.

"If you would have told me 3 years ago that we would be seeing grass and trees growing on this area, I wouldn't have believed it," commented Leasure Maple, a Ritchie County farmer who serves on the board of supervisors of the Little Kanawha Soil Conservation District and on the board of directors of the Little Kanawha Resource Conservation and Development Project.

Maple said that the RC&D steering committee then met with engineers from the State Department of Highways regarding siltation in the North Fork from construction of U.S. 50.

"I feel this had an input toward conservation treatment to

A soil conservation district work crew, hired by B&O Railroad, spreads fertilizer and seeds the critically eroding areas with Kentucky 31 fescue grass (top photo). The crew also planted trees and shrubs above the new railroad line to protect the slopes from the erosive action of rainfall.





Coauthor Roger Rayburn returned to the revegetated area in its third growing season this year and found some of the locust trees 20 feet high. Autumn olive has also done well at the site.

highway construction areas here and elsewhere in West Virginia," Maple said.

Ritchie is a hilly, rural county where most of the land disturbance on private property has been on farms. The red clay hillsides erode easily when cleared.

Farming became the major land use in the mid-1800's when new roads and the B&O opened up the area. Row cropping on the steep hillsides caused the loss of the most fertile upland soils.

Today, most of the farmers in the area raise beef cattle part time and work in nearby chemi-

cal plants along the Ohio River. They keep the hillsides in permanent grass cover, but lack of fertilization and worn-out soils often result in a thin ground cover that erodes even under moderate grazing pressure. Because of the steep terrain, it's difficult or impossible to drive wheeled vehicles to apply lime and fertilizer on much of the land.

In response to the RC&D concern, the soil conservation district has asked SCS to inventory critically eroding areas in the entire North Fork of the Hughes watershed. The district is working to encourage land-

owners to improve ground cover to reduce siltation of the river.

"The revegetation of the B&O tunnels is only a beginning," said Dolph Hickman, another district supervisor from Ritchie County.

"We'd like to see everyone in the watershed work together to make the river run clean again."

"Fish reproduction will improve as the siltation in the North Fork slows up," concludes Charlie Wilson. "The fishing will be just like in the good ol' days." ♦

Soil surveys

Arkansas

Pulaski County. By George J. Haley, Randle O. Buckner, and Dorris F. Festervand. 1975. Soil Conservation Service in cooperation with Arkansas Agricultural Experiment Station. 65 pp., illus.; maps.

Iowa

Fremont County. By Lewis A. Clark and John R. Nixon. 1975. Soil Conservation Service in cooperation with Iowa Agriculture and Home Economics Experiment Station, Cooperative Extension Service, Iowa State University, and the Department of Soil Conservation, State of Iowa. 104 pp., illus.; maps.

Kansas

Ellis County. By Robert K. Glover, Larry D. Zavesky, William R. Swafford, and Quinten L. Markley. 1975. Soil Conservation Service in cooperation with Kansas Agricultural Experiment Station. 86 pp., illus.; maps.

Maryland

Harford County Area. By Horace Smith and Earle D. Matthews. 1975. Soil Conservation Service in cooperation with Maryland Agricultural Experiment Station. 118 pp., illus.; maps.

New Jersey

Sussex County. By Sylvester J. Fletcher. 1975. Soil Conservation Service in cooperation with New Jersey Agricultural Experiment Station and Cook College, Rutgers University. 119 pp., illus.; maps.

New Mexico

Santa Fe Area (Santa Fe County

and Part of Rio Arriba County). By James J. Folks. 1975. Soil Conservation Service and Forest Service, and United States Department of The Interior, Bureau of Indian Affairs, in cooperation with the New Mexico Agricultural Experiment Station. 114 pp., illus.; maps.

Ohio

Union County. By D. D. Waters and F. Matanzo. 1975. Soil Conservation Service in cooperation with Ohio Department of Natural Resources, Division of Lands and Soil, and Ohio Agricultural Research and Development Center. 79 pp., illus.; maps.

Pennsylvania

Franklin County. By Richard S. Long. 1975. Soil Conservation Service in cooperation with The Pennsylvania State University, College of Agriculture, and the Pennsylvania Department of Environmental Resources, State Conservation Commission. 122 pp., illus.; maps.

Virginia

Madison County. By J. H. Elder, Jr., and D. E. Pettry. 1975. Soil Conservation Service in cooperation with Virginia Polytechnic Institute and State University. 143 pp., illus.; maps.

Meetings

December

- 2-5 Western Forestry Conference, Vancouver, British Columbia
- 3-5 Twenty-second Annual Meeting Keep America Beautiful, Inc., Washington, D.C.
- 4-5 National Association of Manufacturers, New York, N.Y.
- 8-12 American Geophysical Union, San Francisco, Calif.
- 9-11 American Seed Trade Association Corn & Sorghum Industry Research Conference, Chicago, Ill.
- 11-12 American Seed Trade Association Soybean Research Conference, Chicago, Ill.
- 12-17 Second World Congress on Water Resources, New Delhi, India
- 15-18 American Society of Agricultural Engineers, Chicago, Ill.
- 28-30 Joint Meetings—American Agricultural Economics Association and American Economic Association, Dallas, Tex.

January 1976

- 13-17 American Seed Trade Association Garden Seed Conference, San Francisco, Calif.
- 14-15 National Council of Farm Cooperatives, Washington, D.C.
- 19-22 National Wool Growers Association, Wichita, Kans.
- 19-22 North American Game Breeders and Shooting Preserve Association Convention, Milwaukee, Wisc.
- 27-30 American National Cattlemen's Association, Phoenix, Ariz.

February

- 1-5 National Association of Conservation Districts, Honolulu, Hawaii
- 4-6 Commercial Fish Farmer Showcase (Catfish Farmers of America Official Convention), Biloxi, Miss.
- 16-20 Society for Range Management, Omaha, Nebr.
- 18-24 American Association for the Advancement of Science, Boston, Mass.
- 20-23 American Association of School Administrators, Atlantic City, N.J.
- 22-25 Sprinkler Irrigation Association Technical Conference, Kansas City, Mo.
- 25-27 Land Improvement Contractors of America, San Diego, Calif.

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Conservation

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U. S. Department of Agriculture / Soil Conservation Service / January 1976



Youth: Partners in Conservation

More than 160 Youth Boards organized by conservation districts now are giving senior high school students a chance to be partners in conservation planning and action. The Soil Conservation Service applauds this innovative endeavor by districts.

With district leaders as their mentors and guides, Youth Boards already have given new impetus to ongoing district conservation programs. They have carried out a wide variety of special conservation projects and activities.

In Virginia, the Youth Board of the Northern Virginia Soil and Water Conservation District organized and got county officials to fund the Fairfax County Youth Conservation Corps for 2 years. The Corps blazed park trails; collected and tested water samples; conducted nature tours in a regional park; and mapped the location of sediment deposits in two small watersheds.

In Utah, the Soil Conservation District Junior Board in Tooele County has for 2 years collected standard snow survey data on four snow survey courses. The Junior Board also organized high school students to seed by hand several critically eroding areas where air pollution from an old smelter had killed vegetation.

In Illinois, the Youth Board of the Coles County SWCD initiated a city leaf collection project, with the tons of leaves used as mulch on severely eroding rural lands.

In Connecticut, the Youth Board of the Litchfield County SWCD produced and distributed to more than 1,000 county residents

a brochure on measures that homeowners could use to control gypsy moths and elm span worms.

In Wisconsin, the Youth Board of the Green Lake SWCD planned, organized, and helped develop the outdoor classroom for the Berlin school system.

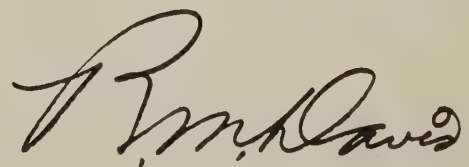
In Kentucky, the Youth Board of the Clark County SWCD stabilized a 50-acre eroding area adjacent to the high school by grading and shaping it and then seeding Kentucky fescue and clover.

Other recent Youth Board projects include:

- building conservation exhibits for fairs.
- helping plan and lay out bicycle trails.
- carrying out a streambank repair and maintenance program.
- preparing slide programs on conservation for students.
- conducting a litter-free stream program.

This impressive array of accomplishments makes one wonder how a district board can afford to be without a Youth Board. There is evidently a tremendous potential for advancing the cause of conservation in combining the experience and wisdom of local district officials with the energy and enthusiasm and scientific knowledge of young people.

All of us have a stake in seeing to it that today's young people have a chance to learn more about conservation, to develop skills as conservationists, and to help make decisions about the kind of environment in which they want to live. Starting a Youth Board is one good way of creating such opportunities.



 SOIL
conservation

Contents

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Earl L. Butz
Secretary of Agriculture

R. M. Davis, Administrator
Soil Conservation Service

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- 2 From the Administrator
- 4 A Youth Project With a Big Heart
Donald Menard
- 6 Conservation Plant Materials Make Good on 'Moonscape'
Thomas W. Badger
- 8 Student Guides in Vermont Lead Natural Resource Studies
Linda J. Prescott and Robert M. Towne
- 10 Half a Century of Tree Planting
Orlin I. Lyng
- 12 A 'Snow' Job for Utah Youth
Beverly J. Miller
- 14 'Our Little Paradise'
Anne Zack
- 16 Outdoors Study Multiplies in Mobile
Morris Gillespie
- 18 Native Grasses and Wildflowers—Low Maintenance Plants
Kent Alverson
- 21 Kleingrass 'On the Move' in West Central Texas
Charles R. Adams
- 22 Apples Add Up on Protected Hillside
Frank Jeter, Jr.
- 23 Soil Surveys
- 23 Meetings

COVER: Improving grazing lands not only helps protect soil and water resources but provides for greater weight gains by livestock. On this farm in the Oneida Soil and Water Conservation District in Idaho, cows and calves feed on a good stand of intermediate wheatgrass.

A Youth Project With a Big Heart

by Donald Menard

District conservationist, SCS, Franklin, Louisiana

"One of the most rewarding experiences of my life" is the way Lawrence St. Blanc describes a project by the seven young people to whom he serves as an adviser: the Junior Board of Supervisors of the St. Mary Soil and Water Conservation District (SWCD) in southern Louisiana.

The project is an outdoor classroom at the Center of Hope School, a day school in Centerville dedicated to developing the capabilities of the mentally retarded in St. Mary Parish.

The outdoor classroom includes a nature trail with gravel path, birdbath, park bench, and picnic table. It provides learning opportunities in self-help skills, language development, community adjustment, and motor development for the 37 students, ages 2 to 30, currently enrolled in the school.

The project began 2 years ago during one of the Junior Board's regular brain-storming sessions to seek out community service projects. The Board, appointed by the St. Mary SWCD, is comprised of high school students who help focus attention on local natural resource problems and ways of solving them.

The idea of the Junior Board spearheading the development of an outdoor classroom at the Center of Hope School re-

ceived the wholehearted support of Pat Bertrand, who attended the session. Bertrand was then president of the St. Mary Parish Association for Retarded Citizens (SMARC), which had just founded the school.

Through income from membership dues, contributions, fundraising events, and matching federal funds, the nonprofit SMARC built the school in a central location so local students could live at home and commute to school. Previously, children had usually been institutionalized in private or public facilities in other parishes due to lack of local facilities.

As word of the Junior Board's project spread, civic and service organizations, businesses, school classes, youth groups, police and fire departments, and government agencies offered assistance and supplies.

With the approval of SMARC and the help of several specialists from the Soil Conservation Service, the Junior Board members developed a plan for the outdoor classroom.

The parish police jury, which is the local governing parish body, supplied needed gravel for the trail through a small wooded area on the 5-acre school site. The Bayou Vista and Patterson Knights of Columbus donated a picnic table and the St. Mary SWCD sup-

plied materials for the park bench built by a local Future Farmers of America (FFA) chapter. FFA members also built and installed a wooden bridge over a drainage ditch on the school site.

Work crews were formed by the Junior Board members from the organizations and classes in their respective schools. Fifteen to 20 young people, including the members of the Junior Board, often worked on the project after school and on weekends.

A small vegetable garden, included in the Junior Board's plan, was planted next to the school building and is now used by students of all ages to study the care and growth of plants.

Mrs. Brenda Herndon, one of the teachers provided to the school by the Louisiana Department of Hospitals, uses vegetables from the garden to teach food preparation.

"The garden and trail are good therapy for most of the students," said Miss Janice Dabney, one of the teachers employed by the St. Mary Parish School Board to work at the school. "Long field trips are just about impossible, but the classroom here on the school site is so handy we can use it anytime we want."

"One of the best ways our students learn is by seeing

things and by repetition," said Mrs. Cathy Mitchell, another regular user of the outdoor classroom. "The trail provides many such opportunities."

Classes may return to the same area along the trail each day, repeating lessons from the preceding day and also noting changes that may have occurred.

"For students with coordination difficulties," added Mrs. Mitchell, "the trail also furnishes the physical exercise they need for motor development."

The outdoor classroom at the Center of Hope School will never be completed. The people involved, including the Junior Board members, see the classroom as a dynamic program. New plants are grown each year and new adventures and learning experiences are combined with past lessons and familiar plants and animals.

Junior Board members are working with students and teachers to erect bird feeders and houses, improve and enlarge the picnic area, plant more flowers for color and variety. As a lead-in to animal studies, they are helping construct a sand area where students can observe and identify

the tracks of animals passing through the site.

As with the outdoor classroom, the school itself is continuing to grow. A second building with an additional classroom, a gymnasium, and physical therapy facilities is nearing completion.

SMARC is working on plans for a "sheltered workshop" which would provide retarded citizens over the age of 21 with meaningful employment.

For the Junior Board of Supervisors, work on the outdoor classroom has turned into more than a one-time community service project. It has given the board members insight into some very special community problems and ways they can help solve them.

"The Junior Board has given a lot to the school," said Pat Bertrand of SMARC, "and I think they as individuals have gained a lot in return." ♦



Mrs. Cathy Mitchell (top photo), a teacher at the Center of Hope School, uses the nature trail for classwork. At right, Junior Board member David Robicheaux shows students how to transplant tomato plants for the vegetable garden. The garden is part of the outdoor classroom set up by the Junior Board of Supervisors of the St. Mary Soil and Water Conservation District in Louisiana.



Conservation Plant Materials Make Good on 'Moonscape'

by Thomas W. Badger

District conservationist, SCS, Columbus, Kansas

Conservation plant materials developed by the Soil Conservation Service may not be growing on the moon, but in the southeast corner of Kansas several are making it on topography that resembles a moon landscape.

The 20,000 acres which have been surface mined for coal in the Cherokee County Conservation District are a conservation nightmare—the most adverse possible seedbed for



Author Thomas Badger looks at a surface-mined area, nearly barren of vegetation and which has not been reclaimed.



plant growth. Much of the land has been left in spoil banks to revegetate itself. This has proven to be a slow process and the resulting vegetation is of poor quality and leaves an unattractive landscape.

In a cooperative effort, the SCS Plant Materials Center at Manhattan, Kansas, has provided more than 50 species and varieties of trees, shrubs, grasses, and legumes to the conservation district for plant materials trials by cooperators in surface-mined areas. The survival rate on many species was almost zero. This was due in part to the low pH—much of the land has been left in extremely acid spoil—and also to summer drought and improper planting methods.

However, a few species have made an excellent showing.

Kanlow switchgrass, used as

Smoothed surface-mined land (center) on this farm in Cherokee County Conservation District, Kansas, has been successfully seeded to native grasses for pasture. At far left is land that has not been reclaimed.

a shoreline planting, has spread over a wide area from its original plantings. It has stabilized the shoreline around “strip-pit” lakes and provided escape and nesting cover for waterfowl.

Emerald crownvetch has also provided excellent ground cover. It has spread by rhizomes to adjacent plots of legumes and grasses, and in every area where it was planted it has crowded out all other vegetation except trees. On one site, it formed a 3-inch layer of mulch in 3 years.

Mixtures of native warm season grasses provided good cover on smoothed surface-mined land. It takes a little longer to establish native grasses, but once established, they fill in the bare areas. They have provided excellent wildlife habitat as well as usable forage for grazing by

livestock. Native grasses supplement the forage needs of livestock during the summer months when tame cool season grasses are somewhat dormant.

Kudzu has also shown vigorous growth. One planting has completely covered an island in a “strip-pit” lake and another planting is rapidly spreading over an ungrazed area.

Several tree and shrub species have also been successfully established.

These trees and shrubs, along with the adapted grasses and legumes, show that the revegetation work on a “moonscape” is possible.

Adapted plant materials, the right seeding or planting methods, and proper management are key factors in reclaiming these surface-mined lands. ♦



The life cycle of the caddisfly is the subject of a "lecture" by student guides as a class looks for caddisfly larvae in a stream.

Student Guides in Vermont Lead Natural Resource Studies

by Linda J. Prescott and Robert M. Towne

Information specialist, SCS, Burlington, Vermont, and
district conservationist, SCS, Essex Junction, Vermont

"Learning while teaching" is a theme that's carried out in an outdoor laboratory used by students throughout Vermont.

Last year, high school guides helped 800 elementary students learn about natural resources at the 50-acre nature complex at Mt. Mansfield Union High School in Jericho near Burlington.

"More than 70 students signed up as guides this school

year," said Bob Smith, science coordinator at the school and the originator of the student guide program. "It's the largest club in the school."

Brian Thornton, a senior, reflects student enthusiasm for the volunteer guide program. He not only attends the required training seminars, but gives willingly of his spare time to work on the nature trail.

There's a lot of maintenance work to be done, such as clear-

ing brush, mending bridges and marking trails, and it's all done by students.

During the school year students attend required training sessions. The sessions are conducted in cooperation with the Soil Conservation Service, Forest Service, Extension Service, and the Vermont Department of Fish and Game. Specialists from these agencies work in

their respective areas with the students.

As SCS district conservationist, Bob Towne works with student guides in soil surveys. He and the guides dig five to six holes in the nature area for soil profiles and then study the limitations of the soils for their uses. By feeling the soil and looking at it, students begin to acquire a respect for the soil and its capabilities.

Occasionally, training sessions move out of the study area, which includes marsh and woodland, into the higher mountainous elevations. Students then integrate their knowledge as it applies to alpine vegetation, soil, geology, and wildlife.

The knowledge that the students carry away from the training sessions is put to use in their work as student guides.

"There are so many things to teach the kids," says Robin, a junior. "As student guides, we stress the importance of everything from fungus to trees in the ecological systems."

The guides usually travel in pairs with a group of six youngsters. That way, they can keep a close watch on those prone to wander.

A game is played to teach a lesson in safety. When the student comes to a branch, he or she passes it to the person behind and waits for a thank you. Lessons often result from unexpected events. Brian Thornton recalls the time his group was late getting back to the bus. "We saw a snake eating a frog, and we had to wait to see the frog go down inside."

Bob Smith says he feels that the student guide program offers the high school students as much as the younger ones.

"They gain confidence in themselves and through this broad knowledge of natural re-



sources, many students are inspired to go on to college to become soil scientists, foresters, biologists, ecologists, or to go into other related professions."

But perhaps most important, these young citizens and future voters will be made aware of their natural resources, and the necessity of conserving them. ♦

Above, a student guide shows elementary school students how to tell red pine needles from white pine. Below, both guides and class take a break and cool off during a tour of the school nature complex.



Half a Century Of Tree Planting

by Orlin I. Lyng

District conservationist, SCS, Bismarck, North Dakota

This year, in his 48th year of planting trees, Edward Flanagan plans to plant a bicentennial windbreak on his North Dakota farm northeast of Bismarck.

He began planting trees in 1928 to stop the cold wintry winds around his farmstead and to get some protection for his livestock. Then, he went to the Missouri River bottoms and dug

out cottonwood, ash, and boxelder and dug them in by hand around the west side of his farm.

When the drought years of the 30's hit and were about to wipe out the newly started windbreak, Flanagan recalls how he and his wife were able to save the shelterbelt "by hauling water to the trees by placing a barrel on a stoneboat

pulled by the farm chore team."

Flanagan was among the first district cooperators in the South Burleigh Soil Conservation District, signing up in 1942, a year after the district was formed. He has carried out his conservation plan to the letter over the last 33 years.

He has put many conservation practices on the land—sod waterways, wind stripcropping, stubblemulch fallow, crop residue use, proper range use . . . and farmstead and single-row windbreaks.

In 1959, he planted 5 miles of single-row windbreaks every 20 rods across all his fields to reduce wind erosion on his cropland. He planted as many tree and shrub combinations as possible with the varieties available. The tree species included

Edward Flanagan hoes around recently planted trees in a windbreak.



Dropmore elm, Siberian elm, ash, American elm, and Russian olive. The shrub species included caragana, honeysuckle, and chokecherry.

Over the years Flanagan and his wife have gained a soft spot in their hearts for ash and Ponderosa pine. "If I were going to start over today on my windbreaks, I'd plant a lot more ash and pine," he says.

In addition to the many windbreaks, the Flanagans planted an orchard which produces many varieties of apples and plums.

Ask Flanagan what he considers some of the important steps in getting a good windbreak and he replies: "Call on the Soil Conservation Service to help you plan and lay out the area where you are planting the trees. Summer fallow the area at least 1 full year before you plant. After the trees are planted, keep the weeds out of the windbreak, both between the rows and in the row. Some of my windbreaks 20 years old are still being cultivated."

Wildlife of all kinds have found a home in the Flanagans' windbreaks and at one time, more than 150 pheasants were counted as they walked through the yard to a winter feeding area.

Flanagan has been active on the board of supervisors of the conservation district over the years. He was elected to the board in 1948 and has missed only two meetings since then—he was hospitalized with a broken leg after a horse fell on him.

Semiretired now, Flanagan still keeps posted on all activities and is always on hand to help with the many conservation activities carried on by the district. He helps with the annual seventh grade conservation tour, delivers trees to the

grade school winners for the poster contest on "How to Keep North Dakota Clean," helps judge contests sponsored

annually by the district, and helps in other events to honor people for their extra efforts in conservation. ♦

Texas Research Taps Insects For Brush and Weed Control

A report from Texas indicates that insects can be a significant part of the solution to brush and weed control problems which have been bugging western ranchers for years.

Studies under the Brush Control Research Program at Texas Tech University show that insects, in conjunction with chemical, mechanical, and cultural control techniques, may be the ultimate solution to the brush control problem.

Research has demonstrated

that after controlled burning of range brush, mortality of mesquite, pricklypear, and cholla has been increased by the combined effects of insects, drought, and competition with native grasses.

In one test, mesquite resprouts were selected for study following prescribed burning. Half the resprouts in the test were treated with insecticides throughout the growing season; half were not treated. Resprouts not treated showed 53 percent less growth than the treated sprouts, which were protected from insect injury.

The insect study was among 46 projects reported in "Noxious Brush and Weed Control Research Highlights—1974," published by the Department of Range and Wildlife Management, Texas Tech University, Lubbock.

"Noxious brush and weeds infest some 80 percent of usable rangeland in Texas alone," according to Dr. Donald F. Burzlaff, director of the research program and chairman of the Department of Range and Wildlife Management.

"These plants waste water, provide little or no nutritive value to livestock and compete with beneficial plants and grasses.

"Controlling them effectively means millions of dollars annually to ranchers," Burzlaff said. ♦

'Limits'

"Limits," the slide show prepared by the Soil Conservation Service for the Bicentennial, is now available. Tracing the history of the conservation movement in America, "Limits" opens with the early settlers in the New World, when resources seemed limitless.

The 80-slide set can be ordered from the Office of Communication, Photography Division, U.S. Department of Agriculture, Washington, D.C. 20250. Price for the 80-slide set is \$20.50, which includes a cassette narration. A film strip with cassette narration is also available for \$12.50.

A 'Snow' Job for Utah Youth

by Beverly J. Miller

Information specialist, SCS, Salt Lake City, Utah

Horseback . . . snowmobile . . . snowshoes. Whatever it takes, young conservationists in Tooele County, Utah, get to their job—snow surveying.

For 2 years, the 19 members of the Soil Conservation District Junior Board in Tooele County have helped collect snow depth, snow water content, and precipitation figures for the state's monthly water supply forecast report.

In the process, they've saved many dollars in the snow surveying and water supply forecasting program coordinated by the Soil Conservation Service.

The Junior Board members make regularly scheduled monthly trips from October to June to four assigned sites high in the mountainous watersheds south and southeast of the city of Tooele.

They are assisted by their adviser, Leland Beckstrom, vocational agriculture instructor at Tooele High School, and SCS District Conservationist Don Braithwaite.

The sites, known as snow courses, vary in length and contain 5 to 11 sampling stations. At each station, Junior Board members cut a hole with a hollow aluminum tube down to the bottom of the snowpack and bring up a core of snow which they then weigh along

with the tube. By subtracting the known weight of the empty tube, they calculate the water content of the core in inches of water.

Their findings, together with reports from some 160 other snow courses in the state, are sent to SCS state snow survey supervisors—who process the information and fit it into special formulas to obtain the state's water supply forecast for the coming snowmelt season.

The state report in turn is consolidated into a Water Supply Outlook. This report is issued monthly from February through May for the 11 western states and the Columbia River drainage basin in Canada. This covers the area where most of the usable water originates as mountain snowfall.

The reports are used by a wide variety of people in planning and managing water supplies for agricultural, recreational, municipal, and industrial uses.

To get to the remote snow courses, the Junior Board members use pickup trucks, horses, snowmobiles, and snow shoes.

The snowmobiles they use are loaned to the local Future Farmers of America Chapter and SCS reimburses the chapter \$200 per year to help maintain the machines. Precipitation

scales and snow tubes are furnished by SCS, but other needed materials, including horses and snowshoes, are supplied by Junior Board members.

Besides the snow survey work, the Junior Board, composed of 14 boys and 5 girls,





has written several other projects into its annual plan of work. One future project is range plant inventory identification and evaluation study to determine forage and erosion control values of various plants.

In November, they organized

a work force of high school students to hand seed critically eroded areas on Anaconda Company lands where sulfides and other air pollutants from an old Anaconda smelter had severely damaged and destroyed vegetation.

Other activities include helping with a land judging program and a range tour, serving as speakers during Soil Stewardship Week, and helping man the state fair booth of the Utah Association of Soil Conservation Districts. ♦

'Our Little Paradise'

by Anne Zack

Information Division, SCS, Washington, D.C.

Elementary students in Wewoka, Oklahoma, call their outdoor classroom "Our Little Paradise."

When it's time to go outdoors for classwork, "they brighten up as if I had waved a magic wand," said Neva Chelf, one of the teachers at Wewoka Elementary School southeast of Oklahoma City.

Now in its second year of use, the outdoor classroom covers 7 acres of privately owned land within three short blocks of the school. The use of the land was donated by Albert Norvell, a rancher and cooperator with the Seminole County Conservation District.

"Our Little Paradise" is on a hilly site with meadows, fossil deposits, and a pond. Twenty-six species of trees grow there—an unusually large number for that part of Oklahoma. These include hickory, oaks, and pecan, as well as less common species in the area such as wild plum.

The size of the tract and the variety of resources offer many different learning opportunities. In planning the outdoor classroom, teachers assigned each

class an area of responsibility outdoors to tie in with its area of concentration in the science program indoors. The students suggested and planned their specific projects.

First graders are building and maintaining a rock garden, and second graders, a flower garden. Third, fourth, and fifth graders study and maintain the pond, bird feeders, and a weather station. Sixth graders are mapping the outdoor classroom and identifying trees as well as taking charge of general maintenance.

Keeping the concept of the total environment in mind, Wewoka teachers try to weave all these separate lessons into an understanding of the interdependence of life systems.

In addition to their science projects, the students use "Our Little Paradise" for other subjects. It is a source of illustrations for math problems and an inspiration for art and poetry, for instance.

Special education teachers are finding the outdoor classroom to be an invaluable aid. One teacher explained that her

students learn to write and spell more easily by writing in sand because the "feel" of the sand around their fingers helps them remember what they have written.

Interest in an outdoor classroom began in 1973 when Mrs. Chelf and four other Wewoka Elementary School teachers attended a 3-week National Science Foundation workshop in Colorado. Camilla Nash, principal of the school, gave her enthusiastic support to the outdoor classroom project.

John Chelf, SCS district conservationist in Wewoka and husband of Neva Chelf, helped with a conservation plan, and the Seminole County Conservation District donated planting materials and funds for the project. Several townspeople contributed money or volunteered their services. John Chelf said one source of pride in the outdoor classroom is that it is a community project developed entirely with local funds.

The students were involved in developing the outdoor classroom from the beginning, said Mrs. Nash. That is nothing

new for Wewoka Elementary School. Students have participated in environmental projects on the school grounds for the last 5 years.

For example, 2 years ago students contributed nickels, dimes, and quarters to buy plants to protect an eroded terrace in front of the school. A committee of students accompanied teachers to a nursery to select the plants. The students

planted their pyracantha, yellow and white euonymus, holly, and ground cover on the terrace. They still water those plants, which is about the only maintenance they need. And they have stopped sliding down the terrace, which caused the erosion in the first place.

"The students' care in maintaining their school grounds and outdoor classroom proves that when children are given an

active part in improving their environment, they do respond with a sense of responsibility," said Mrs. Nash.

"We take the environment too much for granted. If we don't make a conscious effort to take care of it, it will be destroyed.

"This is something children should learn early in their lives, and it is the most important lesson 'Our Little Paradise' can teach." ♦

The formation of soil is the topic as Neva Chelf and a science class study lichen and ferns at the outdoor classroom of Wewoka Elementary School.



Outdoors Study Multiplies in Mobile

by **Morris Gillespie**

Information officer, SCS, Auburn, Alabama

Mobile County Public School System Photo



A 640-acre tract, a few miles from downtown Mobile, Alabama, is being used to expand environmental education programs in the 83 schools of the Mobile School System.

The acreage includes a forest, a natural area maintained primarily as a preserve, and an instruction area surrounding a 20 acre lake stocked with fish. Officially known as the Environmental Studies Center, the area provides outdoor learning opportunities for the 66,000 students in the school system.

Dr. Michael Magnoli, coordinator of the center, and his staff tailor outdoor sessions to fit the needs of the visiting class.

As the program and facilities at the center expand, according to Dr. Magnoli, learning opportunities will include not only natural science but also art, music, geography, math, and language arts.

Resource agencies and organizations include the local chapter of the National Audubon Society, which helped to identify birds of the area. The Mobile County Soil and Water Conservation District and the Soil Conservation Service helped with planning and applying conservation practices.

Studying water samples from the 20-acre lake is part of a day's activity at the center.

Plans for the center, owned and operated by the school system, include the addition of a laboratory, museum, library, and planetarium. An arboretum and a greenhouse are also planned along with more trails and foot bridges to make swampy areas more accessible for study. ♦

At right, SCS Soil Scientist Grant Mattox shows students how a soil profile is taken. Below, Vincent Brocato, science supervisor for the Mobile County Public School System, and Lily Dailey, a teacher from Dodge Elementary School, lead students in studying soil organisms.



Mobile County Public School System Photo



Native Grasses and Wildflowers— Low Maintenance Plants

Kent Alverson*

Last year, the national Flower and Garden magazine published an article entitled "Colorful Corridors," telling of the use of native grasses and flowers to stabilize and beautify the highway rights-of-way.

The article mentioned work by SCS plant materials specialists in plant selection. As a result, both the magazine and I were bombarded with requests from housing developers, state grounds maintenance officials, landscape architects, and owners of retirement homes.

Their interest was in plants that could cut maintenance costs as well as beautify. With labor, machinery, fuel, and fertilizer costs up, it is terrifically expensive to keep parks, recreation areas, and other public lands in a presentable condition. This is a problem that has created widespread and growing interest in the use of native grasses and wildflowers for open areas.

State roads and highway officials have taken the lead in the use of native species of plants for erosion control and beautification. In this work they have received special assistance from the Soil Conservation Service and Extension Service. The SCS Manhattan Plant Materials Cen-

ter in Kansas has done extensive work with grasses native to the Midwest prairie.

Others active in promoting interest in native grasses and wildflowers include the Soil Conservation Society of America, nearly 3,000 local conservation districts, many garden clubs throughout the United States, and commercial seed producers.

Not all low maintenance plants are native, of course. Birdsfoot trefoil, a legume with a bright yellow flower, is a favorite for roadside beautification with the Iowa highway department. It has grown for centuries in Europe, Asia, and Africa. The pinkish blossoms on dark green foliage seen along many sections of interstate highways are distinctive features of crownvetch. This is a legume plant developed and improved by the Soil Conservation Service.

According to Bob Lippert, SCS plant materials specialist at Manhattan, the plant materials center has made a big contribution in warm-season grasses. Seed of many native grasses is now available from dealers. Wildflowers and other forbs used in beautification are currently hard to find and must be ferreted out on an individual basis. The Soil Conservation Society of America, Ankeny, Iowa, has published a list of sources, but there is no guarantee of

availability of any particular species or variety.

The trend to native and other hardy plants that are pretty and practical gets the support of both conservationists and preservationists. "Conservation" is the productive use of land without abuse. "Preservation" is keeping land in its natural state. When land is managed principally for its eye appeal and the ease of walking or driving through it, management often requires a compromise. It isn't "idle" land because the public puts certain demands upon it; and it can't be allowed to get too "wild and woolly" as this is offensive to many people.

The situation for the maintenance official is comparable to that of the beautician or hair stylist who is striving for the "natural look." Even to reach a compromise requires real salesmanship.

At the Kansas City International Airport, maintenance director N. A. "Dutch" Bertholf declares that convincing management to change can be a tough problem.

"Everybody must understand that it takes a completely different approach to landscaping. Like growing a beard, you have to make the decision to "go native." Then you have to get all the other people involved in the program to know and accept what you're trying to do. It's an educational process for

* Mr. Alverson was formerly head of the field information unit for SCS at the Technical Service Center in Lincoln, Nebraska. He retired in June 1975.

the public and their elected officials."

But Bertholf feels it is all worthwhile. He has now seeded 180 acres in native grasses. The first seedings, in 1971, consisted

of buffalograss, big and little bluestem, sideoats grama, lovegrass, crownvetch, and blue grama.

Bertholf has worked closely with Fred Markham, landscape

architect for the airport, in the plantings. In addition, SCS assistance has come from both Missouri and Kansas. Bob Lippert of the Manhattan Plant Materials Center has provided

Initial costs for establishing native grasses and wildflowers may run high, with special seeding equipment needed, particularly if the new seedings must compete with well-established vegetation.



seed and technical assistance in planting, as have Richard R. Brown, SCS plant materials specialist in Columbia, Missouri, and Gary L. Reed, SCS district conservationist in Platte City, Missouri.

The original purpose of the airport seedings was for the "image" of midwestern prairie given to air travelers using the airport approach road, says Bertholf. The idea of savings in maintenance costs came later.

"It will practically eliminate

all mowing on the entrance road," says Bertholf. "There is only a 30- to 40-foot span of low grasses for a transition to natives. It will reduce our total mowing costs by two-thirds. There is also a reduction in fertilizer. The natives won't require any fertilizer. Fertilizer costs have risen from \$72 a ton to \$339 a ton in just 3 years."

For ridgetop areas, Bertholf has seeded yellow coneflower. "They will be most dominant in our wildflower plantings. They

bloom all summer," he explains. "There will also be black-eyed-susan in season."

"Our first 3 years have been the most difficult. Once we have the native plants established, we can more or less forget them—just let them do their own thing."

A problem with any grass seeding is competition with established plants. In the case of the Kansas City Airport, the entire airport was earlier seeded to Kentucky 31 fescue, a hardy, competitive grass species. The runway areas will remain in fescue. For the first seeding of natives, the cost ran as high as \$90 an acre. However, costs of future seedings will be less and savings over the years will make it a profitable investment, Bertholf asserts. ♦

Landscape architect Fred Markham of Kansas City and SCS plant materials specialist Robert Lippert weigh carefully each portion of seed chosen for the mixture of native grasses at the Kansas City International Airport.



Nonfederal Sources Provide \$5.6 Million For '74 Soil Surveys

Contributions to soil survey work from nonfederal sources totaled \$5,609,000 in fiscal year 1974—nearly \$1 million more than the year before.

The state with the highest contribution was Ohio with a total of \$698,000 in funds and services toward soil survey work. Three other states each made contributions of more than \$300,000—Iowa (\$394,000), California (\$346,000), and Florida (\$329,000).

Sixteen additional states contributed more than \$100,000 each in funds and services—Connecticut, Illinois, Indiana, Maine, Massachusetts, Michigan, Minnesota, Montana, Nebraska, New York, North Carolina, North Dakota, Oregon, Pennsylvania, Vermont, and Wisconsin.

These contributions include manpower, equipment, and office space as well as cash. ♦

Kleingrass

'On the Move' in West Central Texas

by **Charles R. Adams**

Soil conservationist, SCS, Abilene, Texas



The author shows vigorous growth of kleingrass during its first year of establishment on a farm near Abilene.

For many years farmers and ranchers in west Texas had looked for a grass species that would be adapted to the dry climatic conditions that often beset the area.

The answer was thought to be Coastal bermudagrass, which provides abundant tonnage under proper fertilization and management conditions. Then the energy crises put a tight grip on area farmers as fertilizer prices soared.

Fertilization is a must to gain quality forage production from Coastal bermudagrass in west central Texas. Interest quickly dropped and livestock farmers again started looking at other grasses that would replace Coastal bermudagrass. Plant specialists had been evaluating many grasses imported from

Africa, but it was not until the 1950's that desirable types of kleingrass were introduced and evaluated.

From these introductions, a superior type was selected and released as Selection 75 Kleingrass by the Soil Conservation Service and the Texas Agricultural Experiment Station in 1969. This warm-seasoned perennial bunch-type grass is a sturdy plant growing to heights of 3 to 4 feet at maturity. It has quickly replaced Coastal bermudagrass as the desirable grass to use on livestock farms and ranches. The success of kleingrass in west Texas can be attributed to the similarity in climatic conditions between Africa and west Texas.

Even though I have never visited Africa, discussing klein-

grass makes me feel somewhat at home. I have made a concerted effort for more than 2 years to increase the establishment of Selection 75 Kleingrass in west central Texas. This includes writing news releases on the grass, presenting radio talks and, on many occasions, appearing on television talk shows. Recently at the West Texas Fair in Abilene, a grass display with kleingrass samples drew much interest and attention.

Today thousands of acres have been converted to kleingrass. It is extremely rewarding to plan a practice on a farm here in Texas and return later in the year to see a sea of plants from the homeland—kleingrass from Africa. ♦

Apples

Add Up on

Protected

Hillside

by **Frank Jeter, Jr.**
Information officer, SCS,
Raleigh, North Carolina

"Mountain people treasure their land. They have less of it than people in some parts of the country. So it makes sense to take good care of every square inch of the soil."

That's how Pink Francis, who operates a fruit farm on some of the hilliest terrain you can find, feels about the land he knows in Haywood County, North Carolina.

Francis has been a supervisor of the Haywood Soil and Water Conservation District for 15 years and is currently chairman of the district.

He's a solid backer of conservation programs, not only because they preserve the natural beauty of the mountain surroundings, but also because they are important economically.

Francis' 50-acre orchard is on a hillside so steep that you might think it suitable only for grazing goats, with a good stand of pasture. Yet rows of apple trees grow on narrow ledges or "benches" laid out by the Soil Conservation Service, and a protective cover of grass grows between each tree.

Francis averages nearly 25,000 bushels a year from his orchard over a 7-month season. He grows principally Red Delicious and Golden Delicious but also produces Stayman,



Conservation practices enhance the apple crop for Pink Francis (center).

Rome Beauty, and Courtland "just to even out the season."

He and his wife Ellene enjoy meeting people and do most of their business in retail sales at the orchard. Mrs. Francis handles the retail sales, keeps the books, and supervises the cider operation while her husband manages the farm. At the peak of the harvest season, Francis employs some 30 workers.

"We don't dump a single apple, except what the crows peck," Francis comments. In addition to their "over-the-counter" sales, they ship gift

packages. They can store up to 22,000 bushels of apples in a refrigerated building on the farm.

Apples are their main business, but they also produce cherries, currants, and gooseberries and sell them at wholesale to a nearby grocery store.

Of his venture, Francis comments: "You only need management and a good conservation plan.

"You need the management for the production and marketing of the fruit, and you need a good conservation plan to keep the whole hillside in place." ♦

Soil surveys

California

Sierra Valley Area (Parts of Sierra, Plumas, and Lassen Counties). By Harold R. Sketchley. 1975. Soil Conservation Service and Forest Service in cooperation with University of California Agricultural Experiment Station. 121 pp., illus.; maps.

Florida

Ocala National Forest Area (Parts of Marion, Lake, and Putnam Counties). By D. Gray Aydelott, Henry C. Bullock, Albert L. Furman, Horace O. White, and James W. Spieth. 1975. Soil Conservation Service and Forest Service in cooperation with University of Florida, Institute of Food and Agricultural Sciences, Agricultural Experiment Stations, Soil Science Department. 64 pp., illus.; maps.

Iowa

Madison County. By Elton L. King, Raymond I. Dideriksen, and Charles S. Fisher. 1975. Soil Conservation Service in cooperation with Iowa Agriculture and Home Economics Experiment Station. 118 pp., illus.; maps.

New York

Washington County. By Harvel E. Winkley. 1975. Soil Conservation Service in cooperation with Cornell University Agricultural Experiment Station. 149 pp., illus.; maps.

Ohio

Clermont County. By Norbert K. Lerch, William F. Hale, and E. Larry Milliron. 1975. Soil Conservation Service in cooperation with Ohio Department of Natural Resources, Division of Lands and Soil, and Agricultural Research and Development Center. 97 pp., illus.; maps.

Richland County. By Charles E. Redmond, William H. Brug, John R. Vann, and E. L. Milliron. 1975. Soil Conservation Service in cooperation with Ohio Department of Natural Resources, Division of Lands and Soil, and Ohio Agricultural Research and Development Center. 132 pp., illus.; maps.

Texas

Anderson County. By Daniel R. Coffee. 1975. Soil Conservation Service in cooperation with Texas Agricultural Experiment Station. 92 pp., illus.; maps.

Garza County. By Wayne E. Richardson, Darrell G. Grice, and Lee A. Putnam. 1975. Soil Conservation Service in cooperation with Texas Agricultural Experiment Station. 84 pp., illus.; maps.

Washington

Jefferson County Area. By Fred R. McCreary. 1975. Soil Conservation Service in cooperation with Washington Agricultural Experiment Station. 100 pp., illus.; maps.

New publications

Drainage Around Your Home. 1975. *USDA Home and Garden Bulletin* No. 210. 8 pp., illus. \$0.25.

This leaflet explains for homeowners the five main causes of wetness at homesites (flooding, springs and seeps, seasonal high water tables, ponding of surface water, and slow soil permeability) and reviews measures, such as subsurface drains and site grading, used to improve drainage.

Meetings

January 1976

- 13-17** American Seed Trade Association Garden Seed Conference, San Francisco, Calif.
- 14-15** National Council of Farm Cooperatives, Washington, D.C.
- 19-22** National Wool Growers Association, Wichita, Kans.
- 19-22** North American Game Breeders and Shooting Preserve Association Convention, Milwaukee, Wisc.
- 27-30** American National Cattlemen's Association, Phoenix, Ariz.

February

- 1-5** National Association of Conservation Districts, Honolulu, Hawaii
- 4-6** Commercial Fish Farmer Showcase (Catfish Farmers of America Official Convention), Biloxi, Miss.
- 16-20** Society for Range Management, Omaha, Nebr.
- 18-24** American Association for the Advancement of Science, Boston, Mass.
- 20-23** American Association of School Administrators, Atlantic City, N.J.
- 22-25** Sprinkler Irrigation Association Technical Conference, Kansas City, Mo.
- 25-27** Land Improvement Contractors of America, San Diego, Calif.

March

- 2-6** American Camping Association National Convention, Philadelphia, Pa.
- 13-17** Association for Supervision and Curriculum Development, Miami Beach, Fla.
- 19-21** National Wildlife Federation, Louisville, Ky.
- 19-23** National Science Teachers Association National Convention, Philadelphia, Pa.

28-

- Apr. 2** American Concrete Pipe Association, Coronado, Calif.

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Conservation

U. S. Department of Agriculture / Soil Conservation Service / February 1976



Still Young at Forty

At age 40, the Soil Conservation Service is still a vigorous young agency. One of the reasons is our readiness to try out new ideas. Every one of our authorities began with an idea. Our programs continue to be enriched by innovations to meet public interest and natural resource needs.

Useful new techniques and ideas have come from many sources—our own employees, conservation district officials, land and water contractors, manufacturers—and, importantly, landowners themselves.

Some innovations have been relatively simple, once they've been worked out. For instance, the use of rice hulls as "containers" for tiny grass seed in a grain drill was a major breakthrough in a range improvement program started in the early 1950's in California. It meant any grain drill could be converted to a precision grass drill.

SCSers had experimented with cracked grain, sawdust, even sand, before working with the cup-shaped rice hulls. Their work has resulted in reseeding thousands of acres in the West to legumes and improved grasses.

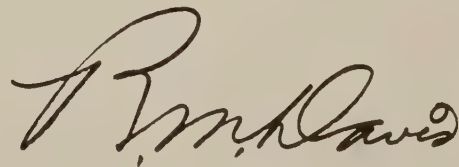
A more recent, more sophisticated innovation is that of SNOTEL—snow telemetry. We're

beginning to use nature's satellites—meteor shower paths—for "bouncing" radio signals to data centers from automatic sensing devices at snow survey reporting stations in the West. The payoff will be more accurate, more timely water supply forecasts.

New ideas may be irritating and threatening at times. Yet we have a responsibility to be receptive and to refrain from an instinctive, instant "No." We have an equal responsibility to avoid the instant "Yes" to new ideas—we need to think them through.

Our budget and personnel situation makes it more important than ever that we be alert to—and seek out—ways to improve both efficiency and effectiveness in managing personnel, fiscal, and equipment resources. We cannot afford to let these resources be underused or improperly used. We encourage landowners to use their natural resources wisely; we can do no less than use our own resources just as prudently.

Our mission offers each of us many opportunities to encourage new thinking in the Service. Innovative work has always been a source of pride in SCS. It's what helps us get the job done—the best way we know how.

A handwritten signature in black ink, appearing to read "R. M. Davis". The signature is fluid and cursive, with a large, stylized "R" and "D".

February 1976, Vol. 41, No. 7

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Earl L. Butz
Secretary of Agriculture

R. M. Davis, Administrator
Soil Conservation Service

Prepared in the Division of Information,
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Contents

- 2 From the Administrator
- 4 'Improved Service' Sparks Berks County Agricultural Service Center
Frederick E. Bubb
- 6 1975 Education Awards in Environmental Conservation
Jan Curtis
- 9 Terraces Protect Glen Ullin
Herbert Mittelstedt
- 10 'Soils and Society'—'Earthy' New Exhibit
At Science Museum of Minnesota
Thomas C. Gahm
- 12 Recycling Resources Pays Off on Oklahoma Ranch
Anne Zack
- 16 Review
- 17 Highlights—1975
- 23 Soil Surveys
- 23 Meetings

COVER: On the Dillingham Ranch south of Tulsa, Oklahoma, SCS District Conservationist John Worthy (left) and Soil Conservationist Dale Ratliff, Jr., (right), look at recovered native rangeland with Tom Dillingham (see story on page 13).

'Improved Service' Sparks

Berks County Agricultural Service Center

by Frederick E. Bubb

Information officer, SCS, Harrisburg, Pennsylvania

Have you ever called a government office, found out you had the wrong agency, and then called three or four numbers before you got the right office? Or have you had to drive from town to town to visit U.S. Department of Agriculture offices? This used to be

the case in Berks County, Pennsylvania.

Recognizing the need for improved service to the agricultural community, Berks County officials looked for an opportunity to improve government assistance. About this time USDA began a program of en-

couraging housing all its agencies in a single building, called an agricultural service center. This concept appealed to the Berks County commissioners and a decision was made to build the first agricultural service center in Pennsylvania.

Agricultural agencies now operate with facilities never dreamed possible. Several sizes of conference and meeting rooms are available, including an auditorium which seats several hundred people. Equipment rooms, ample storage space, abundant parking, and even a lunchroom are extra facilities in the building.

Showing great foresight, the Berks County commissioners added several other uses to the building. Civil defense and county communications are in the basement. The lunchroom is also in the basement and provides a dual role as food support for the civil defense operation. The building contains all county storage and shop facilities. Craig Williamson, of the Pennsylvania Civil Defense Council, termed the building outstanding, attractive,



At the Berks County facility, the conservation district clerk staffs the information center, answering questions of local farmers and other visitors.



The agricultural service center in Berks County is one of five in Pennsylvania.

and at the same time, functional.

The Berks County center houses the Cooperative Extension Service, Agricultural Stabilization and Conservation Service, Farmers Home Administration, and Soil Conservation Service, USDA. Other agencies in the center include the county conservation district, which operates the reception and information center, and an Intermediate Education Unit and County Weights and Measures Office.

County Commissioner Vernon K. Shaffer, who also serves on the conservation district board, states, "I am pleased and proud to have been part of the team that helped make this agricultural center a reality. In this day of hunger in the world, the farmers of Berks County need all the help they can get."

The public reaction to the center has been good. Before the center, USDA agencies were located in three towns. SCS District Conservationist J. Norris Judy reports that more farmers are coming to the agency offices now. Berks County farmer Mark Wolfskill echoed this feeling. According to Wolfskill, "Farmers can now visit all the agencies under one roof, saving them time and gasoline along with the convenient and free parking. I think farmers will now participate in more programs because of the accessibility of visiting all these agencies under one roof."

The Berks County center is one of five agricultural service centers in Pennsylvania. Others are in operation in Erie, Lancaster, Dauphin, and Washington Counties. All are enthusiastically supported by farmers

and agency personnel.

Erie County dairy farmer Calvin Henry commented, "Service centers are a definite advantage to farmers who use the services of a number of agencies. The common phone number and joint meeting room are a big help to farmers."

Another Erie County farmer, Burdette Sedler, added: "It is much easier to get your questions answered promptly." He noted that the modern facilities also benefit the agency personnel.

O. Bard Judy, SCS district conservationist in Washington, Pennsylvania, spoke for all the SCS district conservationists in Pennsylvania who operate in service centers: "We are finding that cooperation between the agencies increases greatly—we are working together more now than ever before." ♦

1975 Education Awards In Environmental Conservation

by Jan Curtis

Information Division, SCS, Washington, D.C.

The National Association of Conservation Districts (NACD) and the Allis Chalmers Corporation have picked the top winners of their Education Awards Program in Environmental Conservation.

One is a North Carolina teacher whose efforts have immersed the community in environmental education.

The other is a Michigan conservation district which has helped 65 schools develop school site conservation plans.

The awards program is de-

signed to create an awareness of the value of environmental conservation education and stimulate efforts by conservation district officials and teachers to advance the wise use of the nation's natural resources.

Mrs. Irene McIver, a third grade teacher in Greensboro, North Carolina, is the 1975 Environmental Conservation Education Teacher of the Year and the Kalamazoo Soil Conservation District, Michigan, has won the district award.

Each will receive a check for

\$1,500 at the NACD convention in Honolulu, Hawaii, in February.

Mrs. McIver, who was runner-up last year, has developed an action-oriented, "hands-on" approach to environmental education at General Greene Elementary School. She and her third graders developed the school site as an outdoor learning laboratory used by all grades at the school.

She is chairman of the faculty committee to develop a program to include environ-

The Kalamazoo Conservation District in Michigan won the top district award in the 1975 NACD-Allis Chalmers education awards program. Pat Chilton, environmental education coordinator for the district, and Lawrence McGowan, district chairman, work with children in an outdoor classroom.



mental education in all areas of study at the school. She has also assisted the faculty at Caldwell, a companion school for grades 4-6, in developing a followthrough program to the environmental studies begun at Greene, which has kindergarten through third grade.

Through her encouragement and leadership, many parents and more than 40 resource people and community groups have helped with the outdoor classroom and environmental studies at Greene.

Greene students have built birdhouses and feeders to be used in backyards, worked on eroding areas at home, cooperated in Greensboro's project of recycling cans, paper, and glass, and participated in Keep North Carolina Beautiful and City Beautiful programs.

In a project called Operation Wildflower, students transplanted hundreds of wildflowers from an area being bulldozed to the school's outdoor classroom.

Mrs. McIver was nominated by the Guilford County Soil and Water Conservation District.

The second top winner, the Kalamazoo Soil Conservation District, now has 65 schools in the district with conservation plans for the entire school site. Fourteen were added during the 1974-75 school year.

The district's efforts last year centered on inner-city schools. Officials sought to help students and teachers use and develop limited land resources and facilities as outdoor classrooms.

With the help of its full-time education coordinator, Pat Chilton, the district held more than 10 in-service workshops during the year to help teachers in outdoor classroom work.

Through a series of community meetings arranged by the district, parents and the community were informed about outdoor classrooms and what they could do to help.

A miniature school site exhibit and a similar home site

display, constructed with the help of personnel from the Kellogg Bird Sanctuary, are often used at meetings and school open houses to help explain outdoor classrooms and wise land use.

The district presents an award each year to the school that has done outstanding work in environmental education. It also sponsors a Conservorama, a day-long tour of the Kellogg Bird Sanctuary, Farm, and Forest, for 2,200 fifth graders. The Conservorama runs for a week and involves the district's junior board and more than 100 volunteers.

Regional winners in the second annual Education Awards Program in Environmental Education in the teacher category were:

Upper Mississippi Region—

Lyle Bradley, high school science teacher, Anoka, Minnesota, nominated by the Anoka County Soil and Water Conser-

Named 1975 Environmental Conservation Education Teacher of the Year, Mrs. Irene McIver teaches in Greensboro, North Carolina.



vation District, runner-up for the national award. Bradley was honored for his program of environmental education at Anoka Senior High School and for his help to 34 schools in environmental education programs and effective use of school sites as outdoor classrooms.

Northeastern Region—Thomas J. Plati, high school chemistry teacher in Dover-Sherborn High School, Dover, Massachusetts, nominated by the Middlesex Conservation District. Plati's interdisciplinary program in environmental research involves his students in studies of local issues, including water quality, air pollution, energy use, and solid waste problems.

South Central Region—Mrs. Carolyn Fiser, sixth grade teacher in J. W. Baker Elementary School, Little Rock, Arkansas, nominated by the Pulaski Conservation District. Mrs. Fiser has been a leader in developing and using a large wooded area adjacent to the school as an outdoor classroom. In addition, she and her sixth grade students developed a miniature outdoor classroom in an open courtyard on the school site, hauling soil, planting trees and shrubs, putting up bird feeders, and installing weather-monitoring equipment.

Northern Plains Region—Robert Legoski, director of the Conservation Center for Creative Learning, Lander, Wyoming, nominated by the Popo Agie Conservation District. Legoski teaches and arranges special conservation and environmental activities and trips for students and in-service workshops for teachers in the Lander School District.

Southwestern Region—Joan M. Charlson, teacher-in-residence at the Jefferson County

Outdoor Education Laboratory in Denver, Colorado, nominated by the Jefferson County Conservation District. All 6,400 sixth graders and their teachers in the county—from 78 schools—participate in a week-long resident program at the laboratory.

Pacific Region—Gerald W. Stoops, junior high school teacher, San Bernardino, California, nominated by the Redlands - Highland - Yucaipa Resource Conservation District. Stoops was selected for his work in involving young people in beautification and community service projects and activities.

Regional winners in the district category included:

South Central Region—Logan County Conservation District, Oklahoma, runner-up for the national award. With the help of its youth board, the conservation district sponsors a week-long environmental camping program for all sixth graders in the school district. Two camps are held each year, one for sixth graders in the Guthrie area and one for sixth graders in the remainder of the county.

Northeast Region—New Castle Conservation District, Delaware, has worked with the State Department of Public Instruction and the 12 school districts in the conservation district in developing outdoor classrooms and organizing teacher orientation and training workshops. The conservation district also sponsored a 10-week summer demonstration project during which 90 students helped develop trails, improve wildlife habitat, and stabilize critical areas in an 85-acre county park.

Southeastern Region—Aiken Conservation District, South Carolina, for its work in help-

ing develop outdoor classrooms; sponsoring students and teachers to state and local workshops; conducting an environmental tour for school officials, mining representatives, ministers, and county officials; and for a community education effort which resulted in unanimous approval of a county sediment control ordinance.

Northern Plains Region—Central Platte Natural Resources District, Nebraska, which sponsored an off-campus 3-credit hour conservation course for teachers. It also initiated an 18-segment conservation education television series available to all schools in the state.

Southwestern Region—A joint entry by the Blacksmith Fork Soil Conservation District and the North Cache Soil Conservation District, both in Cache County, Utah. The districts were instrumental in helping develop an outdoor classroom that will be used by all students in the county. They also successfully encouraged the school district to develop curriculum manuals for kindergarten through the twelfth grades.

Pacific Region—San Jacinto Basin Resource Conservation District, California, which stated: "The most significant contribution made by our district during the 1974-75 school year was the formation of our San Jacinto Basin Resource Conservation District Junior Board." The 23 junior board members developed their own annual plan of activities, which included helping develop outdoor classrooms, planting trees and seeding wildflowers on eroding areas, and securing native plant materials for the environmental education center at their high school. ♦

Terraces Protect Glen Ullin

by Herbert Mittelstedt

District conservationist, SCS, Mandan, North Dakota

What happens when you combine rain, steep slopes, and a light vegetative cover? You get damaging runoff, right?

The City of Glen Ullin, North Dakota, with a population of 1,070, had a runoff problem. It lies at the lower end of a 300-acre drainage area with steep slopes, slowly permeable soils, and poor vegetative cover. After rains the runoff often caused flooding and subsequent sediment damage. Development in the city increased the problem. Water coming into the city through a 60-inch culvert was choked down by 24-inch pipes and blocked drainage ways, and the end result, of course, was flooding.

In March of 1970, city officials asked for help from the Soil Conservation Service to reduce flooding and sediment damage.

The Soil Conservation Service suggested two possible solutions.

One solution involved diverting runoff away from the city. It involved building two bridges. This was not accepted because of the high cost.

The solution agreed to included terraces, diversions, sediment impoundment, and establishment of grass. These works of improvement now hold much of the rain on the land and divert the excess away from the city.

A completed erosion control system, including terraces and diversions, protects Glen Ullin, North Dakota, from sediment and flood damage.



This improvement received a big boost when the landowners in the drainage area agreed to donate necessary easements. One of the landowners, seeing the benefits to his own farm, said, "I can see a day when terraces and diversions will have to be installed if we plan to continue profitable farming." His comment related to the excessive runoff and erosion occurring on cropland in the area with the same soil and slope problem.

The next hurdle was financing. The Soil Conservation Service, through the Resource Conservation and Development Project, agreed to cost share 80 percent of the construction. City officials asked the Morton County Water Management District for help and the district agreed to assume the balance, the local costs.

Diverting water down a state highway road ditch was part of the plan. At a public meeting, a review of the plan with the North Dakota highway commissioner yielded the needed easement.

Bids were let for construction in June of 1973, and construction started in July. When the project was completed in 1974, the result was more than 12,000 feet of level terraces with drains, 10,000 feet of diversions, a sediment pond, a water control structure, and 42 acres seeded to grass. The grass seeding converted the remaining cropland in the drainage area to grassland.

The system got its first big test in the spring of 1975, when more than 15 inches of rain and snow fell on Glen Ullin.

"This is a North Dakota first, using regular conservation practices to protect a town, and quite successfully," said Richard Moum, SCS state engineer. ♦

'Soils and Society'—'Earthy' New Exhibit At Science Museum of Minnesota

by Thomas C. Gahm

Information specialist, SCS, St. Paul, Minnesota

Most conservationists know that soil has important influences on our society and on the way we live. They know, too, that soil is bigger than we are.

The Science Museum of Minnesota and the Soil Conservation Service are proving that point to the half a million students and adults who visit the St. Paul-based museum each year. Making the point is "Soil and Society," a permanent soil and water conservation exhibit which opened last summer.

Walking into the exhibit is like tunneling into a big chunk of soil. When you get inside you begin finding out what makes soil tick and why use of soil has so many implications for our society.

"I don't think people realize that use of soil is really basic to our culture and at the root of many of our problems today," says Diana Hays, director of the museum's physical and environmental sciences section. "In this exhibit we've magnified soil to be bigger than life because in actuality, it is bigger than life."

From the outside, the \$29,000 exhibit looks as if it had been lifted out of the ground. Several soil horizons are visible, with

bedrock as the bottom layer and vegetation at the top. Inside, roots dangle from the ceiling. The floor is a soft carpet, to give the feeling of walking on soft ground.

"We even did some research into simulating the smell of freshly tilled soil," says Ms. Hays, "but decided not to adapt the technology to this exhibit."

Ms. Hays coordinated development of the exhibit. She translated the technical information and ideas provided by SCS personnel into words, pictures, and mechanical devices to attract and inform museum visitors.

"SCS provided more ideas for this project than usual for an outside source," she said. "We depended on SCS because they have so many technical people. A science museum is at its best when working with technical people."

The exhibit puts special emphasis on participation by the visitor and offers many "hands on" opportunities. By far, the most popular is a push-button land use quiz. A visitor can choose one of seven land uses and then select the soil properties most appropriate for that use.

Visitors can also use a soil auger, which extracts a soil pro-

file from "the ground," and settling tubes, which demonstrate how different-sized soil particles stay suspended in solution for varied lengths of time.

"People learn by doing," says Ms. Hays. "They tend to remember with action better than they do just by reading labels."

An entire wall of soil profiles is also popular. The eight profiles, selected for their differences in color, texture, and other physical properties, were gathered throughout Minnesota by SCS soil scientists. The profiles are 5 feet high and mounted in glass cases. Below each profile is a description of the soil—its name, properties, location and use. Above each is a color transparency of the landscape on which the soil occurs. Other features of the exhibit include:

- a comparison of the differences in sizes among soil particles.
- a display showing how the soil survey can be used to estimate differences in crop yields.
- a sculpture showing how different soils occur in a landscape.
- four high-impact color photographs showing people interacting with soil.



At the entrance of the exhibit that is "like tunneling into a big chunk of soil" at the Science Museum of Minnesota are Diana Hays, who coordinated the exhibit, Philip Taylor, director of the museum, and Harry Major, SCS state conservationist in Minnesota. SCS provided technical information and ideas for the new exhibit.

and the general public. Ten-minute demonstrations—based on the SCS publication "Teaching Soil and Water Conservation, A Classroom and Field Guide"—are presented by theater students recruited by the museum. The topics of the demonstrations are: "How Does Crop Cover Affect Soil Loss?," "How Does Mulch Prevent Soil Loss?," "What Does Contouring Do?," and "Make Splash Boards to Study Splash Erosion."

In addition, the museum's Saturday Morning Clubhouse will offer presentations on conservation and careers in soil conservation to groups of up to 250 students.

"Soils and Society" is a step in a new direction for both SCS and the science museum.

For the museum, it is the first time it has used funds from an outside organization to match a special environmental grant received several years ago. The grant stipulates that the museum will use outside community resources to establish a new environment section called "Man's World Today."

SCS has been the major community resource in this particular exhibit, and as a result, people who visit the Science Museum of Minnesota are learning that soil and its conservation is one of the things that makes "Man's World Today" go around. ♦

Captions explain the link between soil and a particular land use.

- a display illustrating how soil erosion and sedimentation contribute to water pollution.
- the SCS series of pamphlets "Soil Surveys Can Help You."

"In planning the exhibit we assumed that the person coming in would have no knowledge of soils at all," Ms. Hays said. "He might have an interest in science or agriculture from a food consumer's point of view but probably hadn't given

a second thought to the problems of soil.

"One of the first questions we asked ourselves was 'how do you get across the fact that soil has a personality, a behavior that is predictable?' We wanted people to see that if they don't care about soil they could be in trouble."

Since the exhibit opened in July, the museum has distributed more than 6,000 SCS publications. More than 12,000 people have been through the exhibit.

A series of special workshops is available to school groups



Recycling Resources Pays Off on Oklahoma Ranch

by Anne Zack

Information Division, SCS, Washington, DC



Driving north from Okmulgee along Oklahoma Highway 75, six bright blue silos stand against the eastern horizon. These silos mark the 11,000 acre Dillingham Ranch—one of the first ranches in the state to retrieve feed from its feedlot.

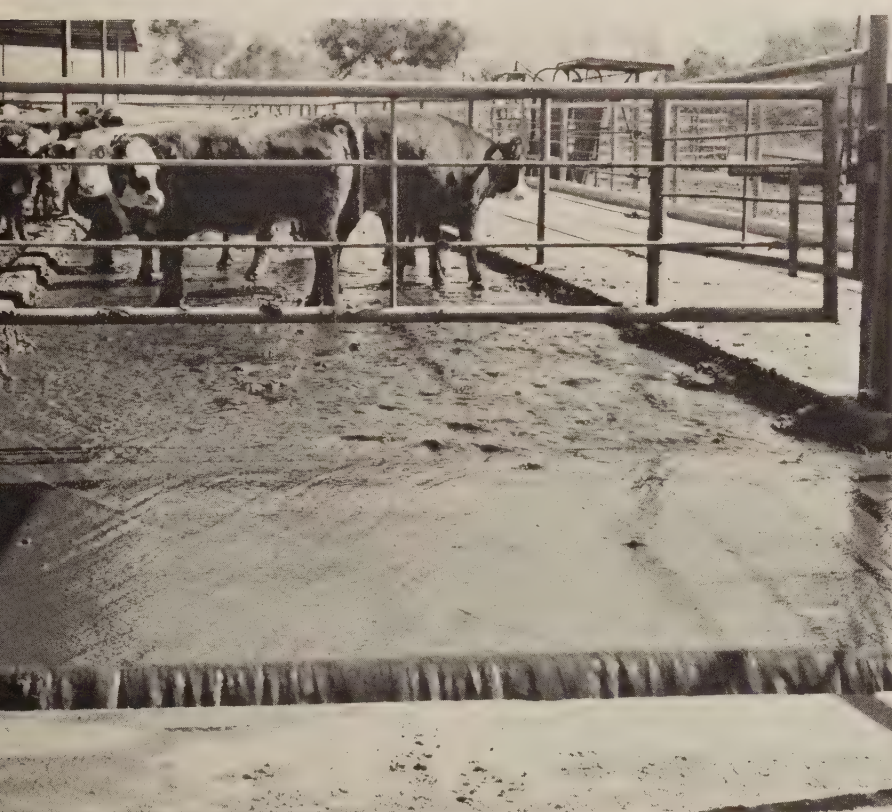
Brothers Tom and Dan Dillingham added the feedlot to their cow-calf operation 2 years ago. The feedlot was designed to use the excess forage produced on their ranch and, also, to avoid polluting a watershed that affects 20,000 people.

When the Dillingham family bought the ranch in 1956, just at the break of a drought, more than 1,200 acres were wornout cropland and the rest was mostly heavily overgrazed range. "The grass was grazed down so short," recalled Tom Dillingham, "that it was slick as the tile floor we're standing on."

Cooperators with the Okmulgee County Conservation District, the Dillinghams requested technical assistance from the SCS district conservationist and area range conservationist in establishing the cropland to bermudagrass, crossfencing the range, and building more than 30 stockwater ponds.

In 1969, the Dillinghams had their conservation plan revised to include a deferred rotation grazing system. Their cattle, mainly Herefords, Angus, and Brahms, are now managed in herds of 240 to 285 cow units. Each herd is assigned two pastures and is rotated between them for three grazing periods during the year.

Under this grazing system, the range produced more indi-



Liquid waste from the feedlot is aerated in a lagoon (top photo) and used as washwater or fertilizer. The feedlot is flushed daily, with water released at the upper end of the sloping pens and emptying into a trench for eventual recycling.



SCS District Conservationist John Worthy and Tom Dillingham look at the native grasses . . .

angrass, big and little bluestem, and switchgrass than the cattle could graze. The Dillinghams wanted to use the excess grass, but they rejected the more common types of feedlots as too inefficient.

Tom and Dan Dillingham traveled from South Carolina to California to check feedlots in operation, read up on university research, and sought technical assistance from SCS so they could design the most efficient feedlot for their purpose.

Completed in 1973, the feedlot has 16 pens and a capacity of 1,600 head of cattle. John Worthy, SCS district conservationist in Okmulgee County, provided soils information and consultive assistance in constructing the feedlot so that the concrete floors slope down to an open concrete trench. Water is released daily at the upper end of the pens to flush the waste into the trench.

The brothers recycle the

solid waste for feed by first separating it from the liquid waste, mixing it with ground hay, and storing it in a silo for 30 to 45 days.

The liquid waste is aerated in a lagoon and then is either re-used as washwater on the pens or as fertilizer on nearby bermudagrass pastures or cropland. Worthy provided assistance in the design of three lagoons on the ranch—one for day-to-day use, another to take care of excess waste, and a third to catch any spillover. SCS technicians also laid out diversions to keep the liquid waste used as fertilizer from polluting Okmulgee Creek.

Because the creek starts on the ranch, about 5 miles upstream from the town of Okmulgee, management of the ranch has a direct impact on the watershed. Besides designing the waste recycling system to avoid pollution, the Dillinghams have helped control

flooding along the creek and in the town by practicing improved range management and by taking part in the Okmulgee Creek Watershed Project.

When the Dillingham family began working with SCS to improve their native range, the only vegetation was sparse patches of low-quality grasses. Rainfall ran off the land with every storm, swelling the creek into a torrent that rushed through the middle of Okmulgee. People caught on one side of the creek could not get across to their jobs, schools, or the hospital on the other side of town.

Now that the native range on the ranch has recovered, the thick grass holds most of the rain, letting it soak into the soil instead of running off into the creek.

Tom and Dan Dillingham took one more step to keep the floods from damaging Okmulgee. They provided all the ease-



... which, under proper range management, now provide bountiful grazing for beef cattle.

ments for the key flood control structure of the watershed project which is located on their ranch.

Since the dam, which can hold back runoff from a 100-year storm, was completed in 1966, Okmulgee Creek has flooded only once. A storm early in June of 1974, prior to completion of planned channel improvement, flooded about 50 blocks of Okmulgee for 2 to 3 hours. Local watershed project sponsors estimate this storm was equal to the one in 1948, when flooding left 2,000 people homeless in a 150-block area for 3 to 4 days.

"Without the land treatment the Dillinghams are practicing and without the dam on their property," concluded Worthy "we simply couldn't have a successful watershed project." ♦

Bulls on the ranch are kept on pastures of Coastal bermudagrass.



Review

The Mechanics of Frozen Ground. N. A. Tsytovich. 1975. Translated from the Russian original by Scripta Technica, Inc. George K. Swinzow, ed., and Gregory P. Tschebotarioff, adv. ed. McGraw-Hill Book Co., New York. 426 pp, illus. \$34.50. Permafrost underlies about 20 percent of the earth's land surface, both in tundra areas and in the forested subarctic. Research into the properties of frozen ground has been underway in North America since World War II, but only after the development of oil and gas resources in the Arctic and the furor over construction of the Alaska oil pipeline has it attracted general interest among engineers. In the U.S.S.R., where permafrost occurs in about one-half of the country, the problem was much more immediate and extensive research was inaugurated many years ago. N. A. Tsytovich, the author of *The Mechanics of Frozen Ground*, has been involved in this research

since 1928 and is a leading authority on the mechanics of frozen soils. His book, published originally in 1973, is an up-to-date exposition of the results of Russian and other (including American) studies of the properties of permafrost and the principles of construction on perennially frozen ground. It is an impressive work.

Frozen ground, he makes clear, is a unique foundation material with properties different from those of all unfrozen materials. It is a heterogeneous mixture—mineral particles of all sizes, ice, films of unfrozen water even at very low temperatures, and air bubbles—that is very sensitive to external influences. Its mechanical properties are strongly affected by temperature variations even in the subfreezing range, for example, and the frozen soil is subject to slow deformation under variable or constant loads. The design of stable structures on these soils requires not only a good deal of in-

formation about their properties at the time of construction, but valid predictions of mechanical changes in the permafrost that are likely to occur during the useful life of the structure.

The book, following a brief introductory section, is divided into two main parts. Part 1 consists of a comprehensive theoretical treatment of the nature of frozen soil, moisture migrations within it during and after freezing, elastic deformations and strength properties of the soil, and changes in its mechanical properties that take place under load or after thawing. The various preconstruction measurements that must be made and methods for calculating the behavior of permafrost under the anticipated load are discussed in detail. Experimental and testing methods are described, and examples of calculations are given.

The second part of the book is devoted to the practical applications of frozen-ground mechanics. Engineering surveys of construction areas, field and laboratory procedures for evaluation of the stability of the site, measures required to preserve the permafrost and to increase its strength, and construction procedures where it is feasible to thaw the permafrost are discussed. Again, examples of practical solutions to common problems are provided. The construction of buildings is emphasized, but short sections are devoted to frozen-core earth dams and to trenching and tunneling in frozen ground. Unfortunately, there is no discussion of highway construction in permafrost areas.

The Mechanics of Frozen Ground will undoubtedly become a standard reference work on the physico-mechanical properties of frozen soils. It is an exceptionally well-organized and well-written book, but it is not for the layman. Engineers concerned with the rapidly expanding construction activity in northern areas, however, will find it extremely useful.—**Samuel Rieger**, state soil scientist, SCS, Palmer, Alaska.

Highlights—1975

Summary of activities of the Soil Conservation Service for fiscal year 1975

As farmers and ranchers stepped up production, the Soil Conservation Service, during fiscal year 1975, provided technical assistance in soil and water management to more than 1 million land users through 3,000 local conservation districts.

Nearly 55 percent of the nation's land is now termed by SCS as "adequately treated" against soil erosion from wind and water.

In the 40th year of the Service, SCS technicians helped prepare 61,500 conservation plans covering nearly 22 million acres and helped revise 27,000 plans covering 18.4 million acres. More than 614 million acres of land in the United States are now covered by conservation plans. These plans establish conservation manage-

ment systems suited to the needs of the land and the land user for adequate resource protection and more rational land use.

Conservation districts as of June 30, 1975, had 2.3 million voluntary cooperators—more than half of the nation's farmers—who were applying and maintaining soil and water conservation practices on nearly 793 million acres.

SCS technicians also provided onsite assistance to farmers, ranchers, and others to make sure that conservation measures were properly planned, installed, and maintained. In fiscal year 1975, SCS provided 2.7 million technical services to land owners and users. The agency also helped more than 14,000 groups of land users, such as neighbor-

ing landowners or community organizations, with conservation plans and related services.

During the year, SCS helped individuals and groups to install 2.4 million acres of contour farming; 366,200 acres of stripcropping; 170,700 acres of vegetative cover on critical areas; and 19,700 miles of terraces. These practices usually were part of an integrated management system.

Minimum tillage, including no-till farming, continued to be one of the fastest-growing conservation practices. It was tried on an additional 2.6 million acres. Total cropland under minimum tillage, which conserves fuel as well as soil, amounted to 36 million acres on the land June 30, 1975.

In cooperation with other interested agencies at the na-

tional, state, and local government levels, SCS began initial inventories in 100 counties to help local decisionmakers to identify prime and unique farmland. The inventory is expected to be an ongoing activity, and in the future will exclude monitoring land use.

Conservation help for units of government

SCS employees furnished nearly 130,000 services to nearly 31,000 local and state governments and their agencies during the year. Nearly 650 local ordinances concerned with land use and erosion and sediment control were passed by local governments, and SCS provided basic soil and water data for drafting these rules. SCS also assisted in preparing 17,500 natural resource inventories and evaluations. With these, local governments, with SCS help, can develop quality standards for conservation land use and treatment.

Woodlands and windbreaks

Landowners, with SCS technical assistance, planted 346,000 acres of trees, nearly 67,000

acres of farmstead and feedlot windbreaks, and more than 2,000 miles of field windbreaks. They prepared 216,000 acres for planting or seeding of forest crops, and improved another 313,000 acres of woodland. Improved harvesting was practiced on 960,000 more acres, to total 35 million acres nationwide.

Pasture and range conservation

SCS people helped farmers and ranchers with pasture and hayland plantings on more than 2.3 million acres during the year, bringing the on-the-land total of improved pasture to more than 77 million acres. SCS assisted in bringing pasture and hayland management to more than 8 million acres during the year for an on-the-land total of nearly 76 million acres. In the West, SCS technicians helped ranchers reseed nearly 381,000 acres, for an on-the-land total of more than 17 million acres.

Plant materials

During fiscal year 1975, seven new conservation plants were released by SCS with cooper-

ating agencies. More than 120 kinds of improved plants selected or developed by SCS now are in commercial production or widespread use in conservation and environmental improvement programs. During the year, several agencies developed cooperative agreements with the Service for accelerating plant materials work for various conservation needs, such as the reclamation of surface-mined lands.

Wildlife

SCS specialists helped landowners improve 11.1 million acres of land and water for the specific benefit of wildlife during the year. They helped farmers install other measures which benefit wildlife, including more than 51,000 ponds.

Great Plains conservation program

During the year, more than 1,800 farmers and ranchers signed contracts under the Great Plains Conservation Program to apply permanent conservation measures on nearly 3.6 million acres. Nearly 50,000 farmers and ranchers have signed long-term contracts cov-

ering more than 90 million acres since the program began in 1956.

Resource conservation and development projects

Resource conservation and development projects are sponsored by conservation districts, local governments, and other public bodies to advance economic development and enhance the environment in multicounty areas. SCS has the program leadership in USDA for RC&D projects. During fiscal year 1975, 10 new RC&D areas in 10 states were authorized for assistance. This brought the total number of RC&D projects to 158, involving 1,057 counties and all states except Alaska.

Water bank program

The 1972 legislation that established the Water Bank Program (WBP) authorized the Secretary of Agriculture to enter into agreements and make payments to eligible persons in important migratory waterfowl nesting and breeding areas for the conservation of wetlands. During fiscal year 1975, SCS assisted land users in the prepara-

tion of 911 conservation plans that support water bank agreements. As of June 30, 1975, 2,368 plans had been developed or revised for the WBP agreements.

Long-term ACP assistance

SCS assisted farmers and ranchers in preparing 3,372 conservation plans that serve as a basis for long-term Agricultural Conservation Program (ACP) agreements. These agreements, which run as long as 10 years, provide cost sharing on selected conservation practices. These plans covered more than 1.6 million acres.

Water resources

Small watershed projects under Public Law 566 combine conservation measures on private and public land with dams and other structural measures to reduce floods and provide water supply, recreation, and wildlife habitat. During fiscal year 1975, 17 watershed projects were completed under P.L. 566, which was enacted in 1954. This brings the total completed since the program began to 396. Thirty-five projects were

authorized for planning, bringing the total to 1,721 and 28 were approved for construction, bringing the cumulative total to 1,124. Construction starts were made during the year on 43 projects. About 9,000 man-years of construction work and related secondary jobs are now being generated, most of it in high unemployment rural communities.

Nine more river basin studies were completed during the year, bringing total completions to 76. Sixty-four additional studies were in progress. SCS also handled 16 flood hazard analyses and made 7 flood insurance studies.

Under the Emergency Assistance-Section 216 program of the Flood Control Act of 1950, more than \$22 million was obligated in 1975 to install such emergency work as streambank stabilization, debris removal, and revegetation to protect life and property after storms and floods. Twenty-three states were involved.

Environmental services

SCS filed 64 draft and 31 final environmental impact statements with the Council on Environmental Quality during fis-

cal year 1975. During the same period, the agency commented on some 1,000 environmental impact statements from other agencies and cooperated in numerous environmental assessment efforts throughout the nation.

Soil surveys

The Service leads the National Cooperative Soil Survey, which has a goal of making and publishing soil surveys of all areas of the United States, Puerto Rico, and the Virgin Islands. During fiscal year 1975, nearly 50 million acres of the nation's land were mapped to show the location and kind of soil. This brings the area mapped under the cooperative federal program to 961 million acres as of June 30, 1975, plus an additional 354 million acres of exploratory soil surveys in Alaska. During the fiscal year, 118 new soil surveys were published covering 60.5 million acres. At the end of the fiscal year, SCS had 873 modern soil surveys covering 418.7 million acres.

Snow surveys

In the West, SCS snow surveyors measure the water con-

tent of the mountain snowpack in winter to estimate how much will be available in the spring and summer. In fiscal year 1975, snow surveyors took 6,278 separate snow course measurements and issued 3,793 water supply forecasts. Progress in automation of data sites continued, with remote sensing equipment purchased for 260 data sites and installed in 160. The data handling system, which includes computer terminals in each of the western states and a mini-computer in Portland, has been purchased and will be installed in fiscal 1976. Communication between the data sites and state office locations has been under study during fiscal 1975, with radio telemetry via either meteor burst or geostationary satellite being the prime candidate systems.

National water assessment

The Service is making major inputs to the 1975 national water assessment by the Water Resources Council. Special reports have been prepared for livestock water use, domestic water use from noncentral systems, upstream flood damages, and irrigation water use. Each

displays a 1975 figure, plus projections for 1985 and 2000, by the 21 water resource regions and 106 aggregated subareas. The irrigation water use study was integrated into a more comprehensive model study involving quantity and value of agricultural production, income, employment, and land use changes and area shifts which might occur in 1985 and 2000.

Colorado River Basin salinity control program

Under authorities of P.L. 93-320, the Service is cooperating with the Bureau of Reclamation to implement programs which will reduce salt concentrations in the Colorado River. The Service is primarily concerned with activities which will improve on-farm irrigation efficiencies, thereby reducing water use, return flows, and salt loadings of the Colorado River due to agriculture. The first contract for cost sharing of irrigation improvements on an individual farm was signed June 26, 1975, for \$16,000. There are 17 areas in the Colorado River Basin involving more than 1 million acres of irrigated agriculture that the Service will be studying. ♦

Summary of Progress, Fiscal Year 1975

Reportable progress in soil and water conservation programs assisted by the Soil Conservation Service

Progress item		Fiscal year 1975	Cumulative to June 30, 1975
Conservation plans and related services			
District cooperators	No.	78,176	2,311,133
District cooperators	acres	27,048,618	792,725,484
Land users assisted	No.	1,021,454	—
Services to land users	No.	2,677,544	—
Land users applying practices	No.	552,728	—
Conservation plans prepared	No.	61,454	1,824,108
Conservation plans prepared	acres	21,926,285	614,452,165
Conservation plans revised	No.	27,029	—
Conservation plans revised	acres	18,416,556	—
Inventories and evaluation prepared	No.	84,358	—
Federal lands under coordinated conservation plans	No.	80	1,447
Federal lands under coordinated conservation plan	acres	1,186,829	16,476,679

Resource planning and implementation for units of government and their agencies

Units assisted	No.	30,841	—
Technical services	No.	129,514	—
Land use and treatment data provided	No.	14,668	—
Resource plan	No.	916	—
Inventories and evaluations	No.	17,512	—
Land use regulations using soil and water data	No.	648	—
Sites for public facility, selected	No.	1,680	—
Sites for public facility, investigated	No.	13,986	—

Long-term Agricultural Conservation Program

Long-term agreements serviced	No.	4,159	—
Conservation plans for long-term ACP agreement	No.	3,372	3,811
Conservation plans for long-term ACP agreement	acres	1,615,398	1,737,531
Long-term ACP agreements expired or terminated	No.	135	138
Long-term ACP agreements expired or terminated	acres	41,446	42,681

Group conservation plans and related services

Groups assisted	No.	14,387	—
Conservation plans prepared	No.	3,008	26,843
Inventories and evaluations	No.	4,835	—
Technical services	No.	71,058	—
Groups applying practices	No.	4,249	—

Great Plains contracts

Applications received	No.	2,583	54,858
Applications received	acres	4,217,652	103,515,844
Contracts signed	No.	1,832	49,626
Contracts signed	acres	3,565,814	90,211,457
Contracts terminated	No.	2,664	34,307
Contracts terminated	acres	4,664,363	56,019,963
Cropland before GP contract	acres	468,880	13,696,256
Planned cropland conversions	acres	84,982	2,884,370

Water Bank Program

Referrals serviced	No.	1,557	—
Plans developed	No.	911	2,368
Plans developed	acres	481,727	1,280,325
Wetland treatment completed	acres	65,906	—

Progress item		Fiscal year 1975	Cumulative to June 30, 1975
Soil surveys			
Detailed soil surveys	acres	40,772,561	879,039,534
Reconnaissance soil surveys	acres	9,144,289	81,887,029
Total surveys	acres	49,916,850	960,926,563
Exploratory soil surveys in Alaska	acres	—	354,062,240

Snow surveys

Snow course measurements	No.	6,278	—
Aerial snow marker course readings	No.	762	—
Mountain precipitation gauge readings	No.	1,882	—
Sites with remote sensing	No.	160	—
River stations for which numerical forecasts issued	No.	465	—
Interpretive water supply forecasts issued	No.	987	—
Statistical forecasts issued	No.	2,806	—

Servicing other USDA programs

Referrals serviced:			
ACP	No.	302,236	—
ACP-18-month program year	No.	—	140,243
Cropland Adjustment Program	No.	16	—
Appalachian Program	No.	189	—
Conservation plans approved	No.	41	—

Recreation development

Land owners and operators:			
Establishing first commercial enterprise	No.	819	75,213
Establishing, expanding, or adding to public recreation developments	No.	398	55,072

River basin studies

Flood hazard analyses	No.	16	—
Flood insurance studies	No.	7	—
River basin studies in progress	No.	64	—
River basin studies completed	No.	9	76

Watershed projects

Applications	No.	23	2,910
Authorized for planning	No.	35	1,721
Approved for construction	No.	28	1,124
Construction starts	No.	43	919
Projects completed	No.	17	396

RC&D projects

Applications on hand	No.	—	64
	acres	—	265,515,000
Project areas authorized for assistance	No.	—	158
	acres	—	666,157,000
Project areas in planning	No.	—	26
	acres	—	86,611,000
Project authorized for operation	No.	—	132
	acres	—	579,546,000
RC&D measures completed	No.	1,530	8,764

Summary of Progress, Fiscal Year 1975—Continued

Reportable progress in soil and water conservation programs assisted by the Soil Conservation Service

Progress item	Fiscal Year 1975		Practice	Fiscal year 1975	On the land— June 30, 1975
Watershed and RC&D project measures					
	Watersheds				
Reservoir-type structure sites:					
Investigated	No.	266	117		
Surveyed	No.	385	208		
Reservoir-type structures:					
Designed	No.	575	193		
Under construction	No.	1,022	292		
Flow control structure sites:					
Investigated	miles	175	54		
Surveyed	miles	267	87		
Flow control structures:					
Designed	miles	545	54		
Under construction	miles	906	149		
Fish, wildlife, and recreation developments (public):					
Surveyed	No.	4	15		
Designed	No.	4	9		
Under construction	No.	21	21		
Services provided on land rights, agreements, and contract awards					
	No.	14,949	2,415		
Practice		Fiscal year 1975	On the land— June 30, 1975		
Agricultural waste management systems			No.	1,258	5,235
Agricultural waste storage facility			No.	1,054	2,944
Bedding			acres	11,068	877,402
Brush management			acres	2,783,310	58,520,495
Burning, prescribed			acres	410,374	6,052,514
Chiseling and subsoiling			acres	784,053	11,435,498
Clearing and snagging			miles	367	8,647
Conservation cropping system			acres	15,604,805	221,581,436
Contour farming			acres	2,403,083	49,246,947
Critical area planting			acres	170,654	5,476,855
Crop residue management			acres	14,482,846	184,922,634
Dams, diversion			No.	246	25,113
Dams, multiple-purpose			No.	244	8,686
Dams, multiple-purpose			acre-feet	74,553	24,185,638
Debris basin			No.	2,403	77,851
Deferred grazing			acres	10,037,892	94,160,470
Dike			miles	237	13,556
Disposal lagoon			No.	978	8,219
Diversion			miles	2,444	106,314
Drainage field ditch			miles	3,673	190,632
Drainage land grading			acres	22,260	561,030
Drainage main or lateral			miles	4,263	391,733
Drain, subsurface			miles	28,606	938,261
Farmstead and feedlot windbreak			acres	66,698	904,464
Fencing			miles	4,069	616,234
Field border			miles	1,159	49,213
Field windbreak			miles	2,256	104,107
Firebreak			miles	2,523	47,119
Fishpond management			No.	45,523	777,102
Fish ponds, commercial			acres	5,020	65,471
Fish raceways			feet	9,053	458,347
Fish stream improvements			feet	163,587	3,361,036
Floodwater diversions			feet	74,159	1,895,734
Floodwater retarding structures			No.	285	12,462
Floodwater retarding structures			acre-feet	160,641	6,727,714
Floodways			feet	124,037	5,243,937
Grade stabilization structures			No.	13,881	263,277
Grassed waterways or outlets			acres	88,800	2,256,586
Grazing land, mechanical treatment			acres	8,197	1,402,796
Heavy use area protection			acres	1,982	197,928
Hedgerow planting			miles	351	25,079
Hillside ditch			miles	36	1,758
Holding ponds and tanks			No.	1,469	8,965
Irrigation canal or lateral			miles	182	56,856
Irrigation ditch and canal lining			miles	1,073	37,123
Irrigation field ditch			miles	1,179	131,206
Irrigation land leveling			acres	243,667	12,498,645
Irrigation pipeline			miles	4,675	110,947
Irrigation pit or regulating reservoir			No.	1,392	48,652
Irrigation storage reservoir			No.	164	41,695
Irrigation storage reservoir			acre-feet	14,397	8,830,119
Irrigation system, drip			No.	287	1,109
Irrigation system, drip			acres	9,122	53,202
Irrigation system, sprinkler			No.	5,441	149,911
Irrigation system, sprinkler			acres	525,898	10,662,212
Irrigation system, surface & subsurface			No.	4,819	183,035
Irrigation system, surface & subsurface			acres	542,584	18,953,563
Irrigation system, tailwater recovery			No.	1,663	20,284
Irrigation water management			acres	2,566,817	23,936,819
Land smoothing			acres	166,449	8,248,683
Lined waterway or outlet			feet	24,595	334,610
Livestock exclusion			acres	381,872	17,581,166
Minimum tillage			acres	2,603,095	35,829,153
Mulching			acres	47,132	1,722,286
Open channels			miles	412	17,069
Pasture and hayland management			acres	8,297,895	75,945,977
Pasture and hayland planting			acres	2,316,308	77,441,400
Pipeline for recreation or livestock			miles	2,873	42,220
Planned grazing systems			acres	4,757,037	55,645,443
Ponds			No.	51,167	2,116,786
Proper grazing use			acres	43,151,435	288,842,905
Pumping plant for water control			No.	2,905	145,687
Range seeding			acres	380,725	17,158,045
Recreation area improvement			acres	34,522	1,607,672
Recreation land grading and shaping			acres	14,532	429,566
Recreation trail and walkway			miles	548	16,555
Road, access			miles	2,228	36,862
Spring development			No.	3,742	146,551
Stock trails and walkways			feet	114,073	21,698,883
Stream channel stabilization			miles	46	1,270
Streambank protection			miles	607	11,250
Stripcropping			acres	366,229	22,524,440
Structure for water control			No.	62,730	2,204,846
Terrace, basin			miles	241	3,178
Terrace, gradient			miles	9,307	715,719
Terrace, level			miles	5,216	420,952
Terrace, parallel			miles	4,955	93,252
Total terraces			miles	19,719	1,233,101
Toxic salt reduction			acres	49,510	1,731,955
Tree planting			acres	345,788	22,692,157
Troughs or tanks for livestock			No.	10,926	615,254
Waterspreading			acres	30,444	1,275,444
Wells			No.	8,380	645,629
Wildlife wetland habitat management			acres	503,345	7,070,970
Wildlife upland habitat management			acres	10,628,330	76,685,436
Wildlife watering facility			No.	953	41,210
Woodland, direct seeding			acres	8,201	882,472
Woodland, improved harvesting			acres	960,307	35,250,357
Woodland improvement			acres	313,379	17,929,188
Woodland pruning			acres	15,184	376,763
Woodland site preparation			acres	216,386	6,162,879
Land treated					
Land protected during development			No.	1,751	14,737
Land protected during development			acres	38,903	386,597
Land adequately treated			acres	24,566,958	—
Land adequately protected			acres	—	1,235,014,088

Soil surveys

Meetings

Arkansas

Howard County. By James E. Hoelscher, Charlie N. McCollum, and Glen D. Laurent. 1975. Soil Conservation Service and Forest Service in cooperation with Arkansas Agricultural Experiment Station. 75 pp., illus.; maps.

Colorado

Chaffee-Lake Area (Parts of Chaffee and Lake Counties). By Louis A. Fletcher. 1975. Soil Conservation Service in cooperation with Colorado Agricultural Experiment Station. 78 pp., illus.; maps.

New Jersey

Passaic County. By Lester L. Seglin. 1975. Soil Conservation Service in cooperation with New Jersey Agricultural Experiment Station and Cook College, Rutgers University. 69 pp., illus.; maps.

South Carolina

Greenville County. By Wallace J. Camp. 1975. Soil Conservation Service in cooperation with South Carolina Agricultural Experiment Station and South Carolina Land Resources Conservation Commission. 71 pp., illus.; maps.

February

- 1–5** *National Association of Conservation Districts, Honolulu, Hawaii*
- 4–6** *Commercial Fish Farmer Showcase (Catfish Farmers of America Official Convention), Biloxi, Miss.*
- 16–20** *Society for Range Management, Omaha, Nebr.*
- 18–24** *American Association for the Advancement of Science, Boston, Mass.*
- 20–23** *American Association of School Administrators, Atlantic City, N.J.*
- 22–25** *Sprinkler Irrigation Association Technical Conference, Kansas City, Mo.*
- 25–27** *Land Improvement Contractors of America, San Diego, Calif.*

March

- 2–6** *American Camping Association National Convention, Philadelphia, Pa.*
- 13–17** *Association for Supervision and Curriculum Development, Miami Beach, Fla.*
- 15–18** *Land Application of Waste Materials Conference, Des Moines, Iowa*
- 19–21** *National Wildlife Federation, Louisville, Ky.*
- 19–23** *National Science Teachers Association National Convention, Philadelphia, Pa.*
- 22–25** *Third Federal Inter-Agency Sedimentation Conference, Denver, Colo.*
- 28–**
- Apr. 2** *American Concrete Pipe Association, Coronado, Calif.*

April

- 5–6** *American Pulpwood Association, Atlanta, Ga.*
- 5–7** *Cordilleran Section Annual Meeting of the Geological Society of America, Pullman, Wash.*
- 7–9** *Fourteenth Annual Symposium on Engineering Geology and Soils Engineering, Boise, Idaho*
- 12–16** *American Geophysical Union, Washington, D.C.*
- 25–27** *Chamber of Commerce of the United States, Washington, D.C.*
- 26–29** *International Hydrology Symposium, Bowling Green, Ky.*

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conservation

U.S. Department of Agriculture / Soil Conservation Service / March 1976



From the Administrator

Subtle Signs of Conservation

More Americans will travel this year to get a closer look at their country during the Bicentennial. Many will be noticing for the first time the impact of conservation on the landscape.

Windbreaks, contour stripcropping, and farm ponds may leap out at us. But there are more subtle signs of conservation, including the plants that replenish the soil and hold it in place.

When European settlers came to the New World, they found a cover that had to be removed for farming. By the time this country was 100 years old, much of the topsoil was gone and the soil exhausted. Some 40 years ago, the damage was so acute that soil was blowing 2,000 miles, from the Plains to the Potomac.

Since then, we've been involved in the selection of plants—both native and introduced—to help with this job of conservation.

In California, we're working on fire retardant plants in areas prone to devastating fires. In Texas, we've helped develop improved grasses that give protection to millions of acres of pasture and rangeland.

Recently, we helped two soil conservation districts in Colorado establish an environmental plant center to develop varieties and assure their commercial availability for reclamation

of mined areas in the Upper Colorado Region.

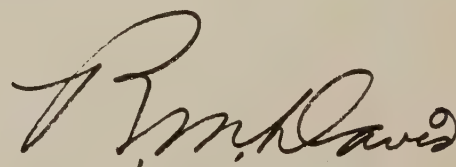
We've also provided technical assistance to the Alaska State Department of Natural Resources to establish a plant materials center to meet the increasing needs for conservation plant materials there.

Early this year, we cooperatively released three certified varieties of native wildflowers for commercial production in the Midwest. These wildflowers, used with native grasses, will help control soil erosion and restore and beautify roadsides and rangeland.

We've now just released another new variety, 'Streamco' purpleosier willow, to protect streambanks in the Northeast. It's already proved invaluable in stream repair projects following tropical storm Agnes.

There's no part of the country where such subtle signs of conservation aren't taking root. Thousands of soil conservation district cooperators each year provide sites for field tests and keep records to help select superior conservation plant materials. SCS's 20 plant materials centers work with them and with other agencies, land grant colleges and universities, and commercial producers in this effort.

It's an effort that is enhancing our country not only for us during the Bicentennial but for generations to come.



March 1976, Vol. 41, No. 8

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Earl L. Butz
Secretary of Agriculture

R. M. Davis, Administrator
Soil Conservation Service

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Contents

- 2 From the Administrator
- 4 Rube Goldberg-Type Invention Sows Cover Crop in Corn
Karl Hellerick
- 6 Down to Earth With Lisa
Gene Warren
- 8 A Second 'First'
- 9 Conservation With CETA
Dick Crowley
- 10 Mobile Conservation Lab at Work in Pennsylvania
Francis R. Licsko
- 12 Scouts Battle Erosion at Cavalry Lookout Post
Ray J. Svacina
- 15 Missouri's New Exhibit Attracts Large Crowds
- 16 Probing for Knowledge of Our Soils
Dick Lehnert
- 21 H. H. Finnell—Pioneer in Wind Erosion Control Research
- 22 Reviews
- 23 Soil Surveys
- 23 Meetings

COVER: This snow might have blown and piled up around a farmyard or road, but for the landowner who put in the shelterbelt of Russian olive. The shelterbelt, south of Fergus Falls, Minnesota, has trapped about 10 feet of snow.

Rube Goldberg–Type Invention Sows Cover Crops in Corn

by Karl Hellerick

District conservationist, SCS, Lebanon, Pennsylvania

It uses a rubber ball, some pipe, a 50-gallon drum, a spring, and a piece of rope. It may seem at first like a Rube Goldberg invention, but it is really the ingenious solution to a conservation problem. It is a forage harvester converted to a seeder for sowing rye in standing corn.

In Lebanon County, Pennsylvania, we found more and more farmers had stopped sowing cover crops in corn. There were valid reasons for not sow-

ing a winter cover crop to protect and enrich the land. Herbicides, such as atrazine, used in corn prevented the use of ryegrass. Decreased cultivation limited the opportunity to sow a cover crop, and seeding after the corn was harvested was too late.

So, there was our problem. We needed to find a way to sow a cover crop which wasn't affected by herbicides in standing corn. Knowing that two or more heads are better than

one, I called on help from other agricultural "experts." Giving an able assist were Newton Bair, County Extension Agent; Ronald Bowers, a vo-ag teacher; and Donald Bollinger, farmer and conservation district director.

First solution was to use rye for a cover crop because rye is not affected by herbicides. Next, I had an idea that there must be an easy way to blow the seed into corn. The result was using a forage harvester converted into a blower to make the seeding. A 50-gallon drum makes a fine seed hopper, and a rubber ball on a wire through the bunghole makes a simple shutoff valve.

District Director Don Bollinger offered to provide the seed, equipment, and a place to try the idea. We used plastic sheets spread on the ground to check distance, distribution, and seed cracking. Through experimentation we were able to regulate seeding rates by varying ground speed.

We found that the blower spread the seed effectively for a 60-foot width. This means that by seeding from each edge,



Don Bollinger's cover crop was sown with the blower late last summer. Corn was harvested in mid-September and by November, the rye was 8 to 10 inches high.



Author Karl Hellerick (left) checks the unique blower-seeder he helped design with Donald Bollinger (on tractor) and Newton Bair (right).

a 120-foot-wide contour strip can be seeded by this method. Maximum width for contour strips in Pennsylvania is 120 feet, according to SCS specifications.

Some harvesters have a tendency to blow all seed away from the machine. A small block of wood fastened to the side of the discharge snout end will correct this problem. The block of wood causes seed to drop near the blower and results in even distribution.

To build the seeder, a 50-gallon barrel is converted into a hopper with a valve to regulate flow into the blower. To do this—

—Cut the bottom out of a 50-gallon drum by either chiseling or burning.

—Mount the drum on a forage harvester or blower, bung down so that the seed flowing through the control valve is pulled into the blower. Fasten it securely with bolts and angle-iron braces.

—Control the seed flow by using standard 1½ inch bushings in a 2-inch bung opening. A rubber ball attached to a rope threaded through the hole over a pulley to the tractor seat makes a simple on-off valve.

The seeder works. The stand of rye seeded last August was excellent by November on the silt loam soils. The stand seeded on the thinner shaly soils also provided satisfactory cover by November.

We found a practical solution

to the problem. It was simple, inexpensive, and effective. I heard a saying once, "Don't say it can't be done. Sooner or later you'll meet someone who has done it!"

It would have been easier to say, it can't be done! But we would have missed out on an interesting and satisfying experience. And, if we have you wondering, plans for this seeder are available from the field office, Soil Conservation Service, Federal Building, Lebanon, Pennsylvania 17042. ♦



Down to Earth With Lisa

by Gene Warren

Public information officer, SCS, Alexandria, Louisiana

Pretty, blonde Lisa Conly walked into the field, shoved a spade into the soil, knelt, let a handful sift through her fingers and said, "There's no doubt about it, this soil is a Ruston fine sandy loam."

Strange talk from a very attractive 16-year-old high school girl? Not really, because Lisa has walked away with top honors in Louisiana as the highest scorer in the 15th annual state Soil Judging Contest sponsored by the Future Farmers of America (FFA). She is the first girl to win in the state contest.

"The funny thing about all this," Lisa says, with a still-

Lisa studies soils with her father, a supervisor with the Saline Soil and Water Conservation District, and James D. Parkman, SCS district conservationist.

disbelieving grin, "is that this is my first year for FFA work.

"My friend, Kathy Owens, and I decided to enroll in the FFA chapter really just to try something different. This is the first year girls can get into FFA work at our school, so we gave it a whirl. Before long, though, we got interested and worked real hard, especially for the contest."

Lisa's interest in the land comes naturally. She is the sixth generation of Conlys to live in

the Ringgold area. All have been farmers and conservationists.

Lisa's parents, Kenneth and Pat Conly, have a 270-acre dairy farm just rock-throwing distance from where Lisa's great-great - great - grandfather first sank a plow in the rolling land some 130 years ago.

Her dad is a member of the Saline Soil and Water Conservation District Board and her late grandfather, Ruel Conly, was a state and national conservation leader.

"When you get right down to it, I suppose it's only natural that I want to know more about the soil and things that grow from it," Lisa said. "I remember Pop Conly pretty well and all the things he did for conservation. He developed much of the land where we live now, and he was once president of the Louisiana Association of Conservation Districts. He also

helped organize the National Association of Conservation Districts."

Lisa likes to show off photographs of her grandfather shaking hands in 1937 with Dr. Hugh Hammond Bennett, the first chief of the Soil Conservation Service, and of her dad when he was an active FFA member years ago.

At home, Lisa helps run the 40-head milking herd. She milks cows, mows pastures, puts up silage and hay, and carries out other chores.

"Really, farm work is good for me," she said. "Most girls may tend to shy away from

Lisa's grandfather, Ruel Conly, greets Hugh Hammond Bennett on a visit Bennett made to Louisiana in 1937 when Conly was president of the Louisiana Association of Conservation Districts.



boys' work, but not me. Besides, Daddy says my brother Kenny and I sure help keep down labor expenses. It makes me feel good knowing I contribute to the welfare of the family. I think many young people miss being part of a family that works as a team."

Clarence Mason, FFA adviser at Ringgold High School, says Lisa is a top student and FFA member. "She was one of the best for the team. There were several students competing for the soil judging team and she and Kathy were near the top of the list." Lisa, Kathy, and two boys represented the chapter as a team at the state contest—and won that also.

Lisa says she learned many good things while studying for the contest. "I've lived out here all my life, seen things grow and all, but never put it all together, like why some plants grow in some places better than in others. Now I know it's usually because of different soils. Don Parkman, district conservationist for the SCS at Ringgold, showed us a lot about soils and how they were formed. That's interesting to me. Now when I go over the farm, or even drive along the road, I see things I never noticed before.

"In the contest we had to learn about soil depth, color, its texture, problems of the land, the amount of slope, and the kind of conservation treatment needed. I used to wonder why dad fertilized grass. Now I know it's to give it food lacking in the soil. I think all this has helped me understand how land should be used and about the need to care for the land for the future."

What would Lisa Conly like to make of her life? "Well I haven't narrowed it down," she says, "but I want to do

something to help people, maybe a professional conservationist of some sort. I'm giving that some deep thought. I think to help people understand the land and its resources would be exciting and rewarding. I have a few years to make up my mind about that, though."

In the meanwhile, Lisa Conly likes to tell how she put some

300 boys in their places when she stepped up and took her plaque for knowing more about the soil than all of the rest. But she will also tell you that winning was a great honor, she owes much to many, and that she wishes her grandfather was around to share in her glory, "Because chances are he was the beginning of it all." ♦

A Second 'First'

We hope we've now "found" the first woman in the country to head a state soil and water districts commission.

We thought we had her last October when we published an article on Betty Broemmelsiek of Missouri's Soil and Water Districts Commission.

Now we think we have her with Elizabeth K. Brown, chairman of the Connecticut Council on Soil and Water Conservation.

After reading our October issue, Ms. Brown wrote:

"It was good to see from your article on Betty Broemmelsiek that women in other parts of the country are also being called upon to lead soil conservation efforts.

"I challenge the statement, however, that she is the first woman in the country to serve as head of a State Soil and Water Districts Commission.

"I was elected chairman of the Connecticut Council on Soil and Water Conservation on September 18, 1974. I am also the chairman of the Hartford County Soil and Water Conservation District.

"The Council is made up

of one representative from each district in the state, and several state officials with environmental responsibilities. It is affiliated with the Connecticut Department of Environmental Protection (DEP) and is charged with coordinating the activities of the DEP and conservation districts. Our major goal is strengthening district operations. Most of Connecticut's soil and water problems stem from rapid urbanization, and we also worry about preserving farmland.

"Just wanted to let you know that Connecticut is in the forefront in recognizing the equality of women. We have a woman governor, you know—

"I find your magazine very interesting and helpful."

As noted in our October article, the Missouri Soil and Water Districts Commission was formed in January 1975 in a reorganization of state government.

Therefore, Ms. Brown is indeed the first woman to head a state soil and water districts commission. Unless we get another letter . . . D.M. ♦

Conservation With CETA

by Dick Crowley

District conservationist, SCS, Mercer, Pennsylvania

Summer maintenance of dams . . . critical area treatment on roadsides and surface-mined areas . . . establishing trails at the nearby McKeever Environmental Center.

These are all conservation projects undertaken by youth employed in Mercer County, Pennsylvania, under the Comprehensive Employment and Training Act (CETA) of 1973.

The Mercer County Conservation District established the Mercer County Environmental Improvement Corps last year

with funding through CETA.

This corps has included two foremen, eight crew members, a soil conservationist, a conservation technician, and a clerk-typist. They receive training as they do conservation work in the district, with the Soil Conservation Service assisting in much of the training.

The corps has worked on park drainage projects, improved fish habitat on McCutcheon Run, and gathered seeds from Arnot bristly locust for conservation plantings

throughout the county. Members have helped complete seven measures of the Penn Soil Resource Conservation and Development Project, from critical area seeding to timber stand improvement, under guidance provided by the Soil Conservation Service.

To provide transportation for the corps, the county commissioners bought a used van from the telephone company.

What is the reaction of the youth involved in the project? Elizabeth Stagl, CETA-employed soil conservationist, said: "Great experience and training—really beautiful! It has given me an opportunity to help those among whom I have lived, the rural people." ♦

Elizabeth Stagl, CETA-employed soil conservationist, looks at the Environmental Improvement Corps' van with Charles McCracken, Mercer County Commissioner, author Dick Crowley, and James Mondok, executive assistant of the Mercer County Conservation District.



Mobile Conservation Lab At Work In Pennsylvania

by Francis R. Licsko

Area conservationist, SCS, Ann Arbor, Michigan*

"Talk about creating environmental awareness—this van will do it."

That's what the president of Westmoreland County Community College near Pittsburgh, Pennsylvania, says about the college's new laboratory-on-wheels.

The 22-foot "Mobile Conservation Lab" contains a sophisticated laboratory for monitoring and testing air, water, and soil. The prime purpose of the laboratory is to train conservation and environmental technicians—employees sought by the steel and coal industries

* formerly RC&D Coordinator, SCS, Monessen, Pennsylvania



Dr. William Shea demonstrates the conductivity meter in the mobile lab to Dr. John Carmichael, president of the college. On opposite page, with Dr. Shea at the wheel, the conservation lab is ready to roll, taking college students and the laboratory to the field for practical instruction.

of the greater Pittsburgh area.

The lab is a teaching tool of the Conservation and Environmental Technology Department of the college. Among the courses in which it is used is one on soil erosion and siltation in urban areas. The course covers soil erosion and sediment control from planning to completion of construction.

Dr. William D. Shea, head of the department and originator and designer of the mobile laboratory, notes that the lab has full capacity for physical and chemical analysis of soils.

"The mobile conservation laboratory provides onsite instruction," Dr. Shea said. "Classroom and laboratory teaching are too confining, too limited, especially in the field of conservation and environmental technology."

Students keep operational performance checklists with special emphasis on data log-

ging, calibration of equipment, troubleshooting, and maintenance, Dr. Shea said.

Organizations involved in getting the van "moving," so to speak, include the Appalachian Regional Commission, the Army Corps of Engineers, the Pennsylvania Department of Environmental Resources, the Penns Corner Resource Conservation and Development Project Council, the Soil Conservation Service, the Westmoreland County Conservation District, and the college's lay advisory committee.

For example, SCS Soil Scientist Jay Weaver helped set up soils instruction using the mobile lab and Executive Assistant Elwood Leslie of the Westmoreland County Conservation District helped in community support of the project. The Penns Corner RC&D Project Council is working to help the college obtain funds

for additional equipment for the laboratory, especially for air sampling.

The green and white van is planned for instructional uses only. However, in emergency conditions, it would be available to local governments for special surveillance and monitoring, according to John Carmichael, president of the college.

"We have already had several fringe benefits from the mobile conservation laboratory," Dr. Carmichael said. "Several of the large industries in the area have asked if they can send their personnel for training on environmental technology."

Now, with the mobile conservation laboratory rolling over the roads of Westmoreland County, a lot of people will see it . . . and think more about conservation and the environment. ♦



Scouts Battle Erosion At Cavalry Lookout Post

by Ray J. Svacina
District conservationist, SCS, Jacksboro, Texas

The hill had once supported a cavalry lookout post for Indians.

Last summer, however, it was the scene of a "battle of erosion."

Armed with newly learned knowledge on controlling erosion, Boy Scouts attacked the eroding hillside with surveying equipment, shovels, and wheelbarrows.

The occasion was the annual ecology camp at the Sid Richardson Scout Ranch in Jack County in north central Texas. The camp, sponsored by the Longhorn Council of the Boy Scouts of America and the Upper West Fork Soil and Water Conservation District, is designed to help Scouts qualify for merit badges in soil and water conservation.

For several years, the Soil Conservation Service has provided instructors for the camp. Last year, the instructors selected the eroding hillside



as an ideal resource to teach ways to control gully erosion.

After several days of field trips and classroom instruction with SCS agronomist Arnold King and SCS soil scientist Lee



Putnam, the Scouts headed for the hill.

They watched SCS area engineer John Pipes pull out a tripod. Several hundred feet down the hill, J. D. Lowrie, SCS

conservation technician, explained the numbers on a Philadelphia rod.

Before long, the Scouts were surveying as if they were professional engineers — even

A surveyor's level gets put to work as Boy Scouts fight a "battle of erosion" at an ecology camp in Texas.

though they had to stand on two flat rocks before they could see through the scope.

The Scouts were told why the erosion occurred . . . and how to stop it. They laid out a diversion terrace to head off the gullies, then picked up shovels and wheelbarrows and constructed that diversion.

Last summer's Scouts are gone now, but their mark remains on the land. It will be one more "visual aid" this summer to explain principles of soil conservation. ♦

SCS agronomist Arnold King provided basic instruction on ecology and biology.



Missouri's New Exhibit Attracts Large Crowds

An estimated one million midwesterners viewed Missouri's new modular exhibit on soil surveys last year, including 200,000 at the Farm Progress Show held near Chicago.

The revolving SCS exhibit stands 7 feet high and consists of eleven 14-inch cubes, each with one or more back-lit transparency depicting various soil uses, both proper and improper.

The primary message is to encourage the public to use soil surveys in land use planning. The idea for the theme came after the Soil Conservation Service published nine leaflets last year on various uses of soil surveys.

The theme is broad enough to be of interest to many groups, including farmers, ranchers, homebuyers, land use planners, and teachers.

Nevertheless, Missouri's modular exhibit isn't limited to this one theme. The transpar-

ency panels can be changed easily to fit an entirely different theme.

Assembly and disassembly of the exhibit takes a few tools

and little time. Cases for the exhibit were designed to fit in a station wagon or pickup truck, thus simplifying transportation. ♦

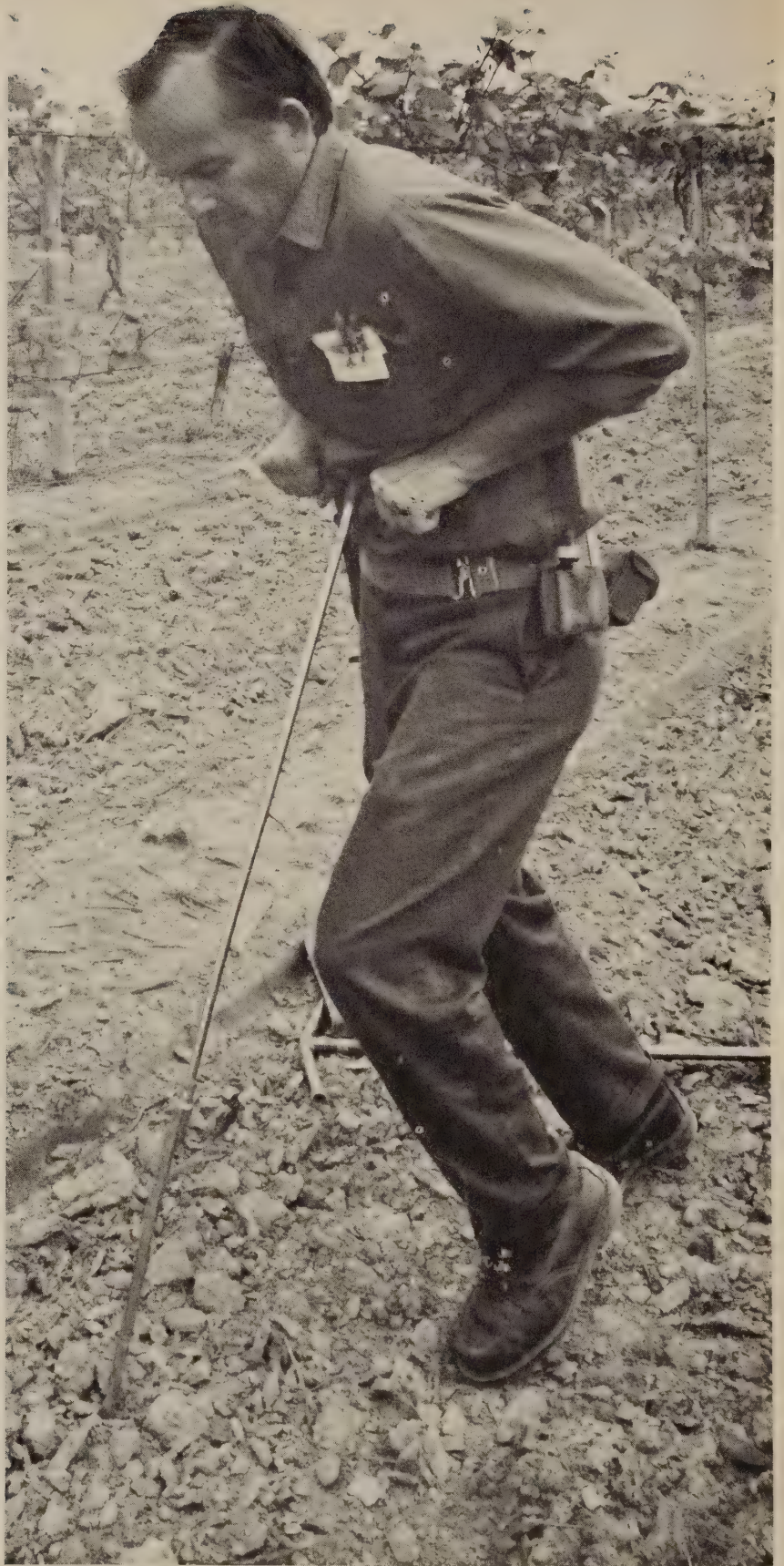
SCS's modular exhibit in Missouri on soil surveys was viewed by an estimated one million midwesterners last year.



Probing for Knowledge Of Our Soils

by Dick Lehnert

(Reprinted with permission from
the Michigan Farmer, September
1975)



"We're moving down off the moraine now and out into the glacier's outwash."

Something about the way Jerry Larson said that made me look over my shoulder, as though I might find that towering wall of ice and a flow of newly melted water and dislodged rock slowly grinding themselves into the soil of Michigan.

But that was gone 10,000 years. Behind me now was a field of green corn busily working on its fourth leaf and, off in the distance, a field of alfalfa in the early bud stage.

Nonetheless it was eerie. Walk out into your own fields and try it. Look at the scratches on some stones, or the smooth roundness of others; look at the hills and the valleys. Realize that what happened thousands of years ago, when this state was being stamped out under the grinding power of the ice age, today affects you.

It affects where and how you build your buildings, and whether the floors and walls stand straight and the basement stays dry.

It affects how well your septic tank and drain field works.

It affects how you manage your land; whether you need conservation methods on the slopes; whether you need tile; what kind and how much tillage your land needs; what kinds of crops you can grow and crop rotations you can use.

It affects how much lime you must apply.

It affects how much pressure your land is under from builders seeking housing sites for urban emigrants.

Jerry Larson knows all that. "You mean you can walk across a man's farm and tell how well his toilet's working?"

I said, and Jerry laughed. "You bet I can," he said.

But he probably won't. Larson, 33, is a tall, well-muscled, smiling son of Swedish immigrants who settled near Edmore in Montcalm County. After spending his young life milking cows and picking up potatoes, he went to Michigan State University which, in 1962, he left as a soil scientist.

After a stretch in the military, he began the practice of

his profession in which, daily and alone, he walks the fields of Michigan boring 5-foot-deep holes in the ground, and by so doing, ferreting out the details of the workings of people's bathrooms and other private details.

He doesn't, of course, do it for himself. He is part of a massive effort, the goal of which is to map every land acre of the state of Michigan by the year 2000. The project is a joint ef-

SCS soil scientist Jerry Larson at work testing for lime . . .



fort of the U.S. Department of Agriculture's Soil Conservation Service, for which guys like Jerry work, the Michigan Agricultural Experiment Station, and the local County Board of Commissioners.

Jerry, the project leader, with David Walling and Danny Tippy, have been working for a year now on what will be a 5-year project to soil map Berrien County. I spent a day with him walking among the corn, grapes, soybeans, and alfalfa on Alvin Ott's fruit and dairy farm near Baroda.

"This county's soil survey will cost about \$250,000, and ultimately the information we gather will end up in publication of about 5,000 booklets," Jerry said. "If the benefits of this project are not understood and made useful, they're no good to anybody. It just becomes an expensive publishing project."

But the land of Berrien County, like that of so many other counties in southern Michigan, is under tremendous pressure. Everybody wants to use it for purposes often in conflict with each other.

"There are a lot of heavy soils in the county, but the soil types run the whole range from 60-foot-deep sand to solid clay," Jerry said.

Often, just the discovery of the nature of the soil itself is enough to end competition for the land. Some of the land cannot be used for septic tanks because it is not permeable enough to water to make a drain field that will work. Sometimes the land is so naturally wet a basement cannot be built without filling with water.

If this kind of information is available, it helps all kinds of people. Buyers looking for home sites won't be bilked out

of their savings—and farmers won't find such land rising in value because of pressure on it. Much land not suitable for building is excellent farmland if handled properly and, possibly, tilled to improve drainage.

The Soil Conservation Service has recently begun publicizing to the general public some of the benefits of soil survey information. They have a series of nine brochures aimed at home buyers, farmers, engineers, developers, builders, and others acquainting them with what soil information is available and how it can help them.

Guys like Jerry and his associates gather that information.

Mapping Soils

Soils have undoubtedly been studied for eons. It's easy to imagine ancient man planning a route that takes his bare feet over sand or organic matter instead of rocks and sun-baked clay. As in many other fields, however, in the last century these kinds of simple observations have been collected and organized scientifically.

What does that mean?

The essence of such scientific work is logical classification. It's done in plants and animals and thousands of other

... and checking the slope of the land.



things, including soils.

Just as the average man knows robins from sparrows from pigeons because of their different characteristics, a soil scientist is able to tell "Pewamo" from "Miami" from "Conover" by knowing the characteristics behind the names. A soil is given a name after each layer (called horizons) to a depth of 5 feet has been described.

What does "Pewamo" mean to a soil scientist? The description goes like this: "The Pewamo series consists of poorly drained and very poorly drained soils formed in loamy glacial till. Pewamo soils have a very dark-brown clay loam surface layer 9 inches thick. The next layer is black clay loam 3 inches thick. The subsoil is grayish-brown and gray mottled with dark yellowish-brown clay loam. Pewamo soils are on till plains, till plains modified by lake waters, and moraines. Slopes range from 0 to 2 percent. Most areas are cultivated."

From this data, he knows the soil is not suitable for drain fields and basements, that ditches dug in it will seep full of water, that roads built on it will break up under the influence of water and frost action. He knows it would be a good soil in which to dig a reservoir or farm pond, and that certain trees grow well, and others do not. He knows that plants that can stand "wet feet" will do better than legumes. And he knows the kind of native plants that will most likely be found growing on it.

More to the point, others besides soil scientists can know it, too. This information will all be included in the official soil survey report for the county, broken down township by township. The information is available to everybody.

There are more than 300 names describing the soils of Michigan and about 3,000 covering the nation. What is startling is not that there are so many, but so few. All the soils of Michigan—36.5 million acres—can be described by 300 names!

And all these names can be discovered with just a few tools and a key that helps arrange what a person can observe into a logical order.

Even with the mental and physical tools, however, map-



ping soils in Michigan isn't easy work, says Jerry. "Forty acres is a big mapping unit here," he said, referring to the variability of the soils. "In some states, all the land in three adjacent sections might be alike."

Essentially, Jerry's job is to mark on aerial photos lines that surround and set apart, one from another, areas of different soil type. His job is to discover the name of the soil, for once it is named many things are known about it, no matter where it occurs. The major problem is that so many fields

change their soil-type name so often.

As a trained soil scientist, Larson does not work strictly by trial and error. He can tell by looking at obvious surface changes when the soil name is going to change. He then bores another 5-foot hole to find what it changed to.

His primary tool is a boring auger with a 5-foot handle. As he cuts a 3-inch diameter hole into the ground, he pulls up soil every few inches. He notes its color, tests its texture by rubbing it between thumb and forefinger. He can estimate pretty closely the relative amounts of sand, silt, and clay in the soil just by feel.

Color is often a giveaway to the soil's internal drainage. If soil is reddish or rusty colored, it is from the oxidation of iron and aluminum in the soil, Jerry said. That means the soil gets air into it to oxidize these metals, and thus it is well drained. Air can't get through water.

If the soil is gray, it indicates it is poorly drained. The gray color comes from what is called reduction of iron and aluminum, and this takes place when oxygen can't get into the wet soil.

A small bottle of hydrochloric acid is used to discover lime in the soil, which bubbles when the acid touches it. This is a test to find when the soil auger has reached "parent material." Most of the parent material of soils in Jerry's area were limy rocks. In northern Michigan, this is not always the case.

Jerry also carries a soil testing kit to determine soil pH, and an Abney level to determine the degree of slope in the land. He carries a soil probe, which he can use instead of the auger in some soils. This

works much faster—if conditions are right so it can be pushed into the soil.

Survey Status

The target of having all the land mapped by the year 2000 is a national goal as well as state, said Rod Harner, SCS state soil scientist. As of July 1, 1975, about 12.3 million acres in Michigan had been mapped, about one-third of the state.

"When soil surveys first started, they were agriculturally oriented," Harner said. "The soil survey and knowledge of soils on farms are basic to our work with farmers." Consequently, most of the land now mapped is farmland and woodland in southern Michigan.

Farmers who have been SCS cooperators have had surveys done on their farms. Soil scientists now are filling in the gaps between farms owned by cooperators, and working on the farms of new cooperators.

"Our goal for the 1976 fiscal year is to do 885,000 acres in Michigan. At that rate, it will take about 25 years to complete the state survey," Harner said.

Since the surveys began, more and more people have found use for the information.

Demand for the data has led to publication of "interim reports" for use by local government agencies and personnel, such as county sanitarians, development plat reviewers, road builders, etc. So when a township is completed, that information is published.

At the end of work in a county, all the information is compiled, published (in several thousand copies), and made available to the general public.

But it doesn't end there. From these soils maps, interpretative maps can be made. For example, Harner said, plastic overlays might be made on which all wet soils with sewage disposal limitations are colored in blue. When that overlay is laid on the soil map, it gives a vivid picture.

Sometimes interpretative maps are made using soils information plus some other kind of information. In Grand Traverse County, for example, soils information has been combined with data on altitude and air drainage. This indicates the degree of suitability of the land as sites for red tart cherry orchards.

The number of uses for soil survey maps is apparently limited only by the number of

people who want to use land—and that appears to be somewhat in excess of four billion on planet Earth. ♦

That's L.I.F.E.

Franklin Parish, Louisiana, has received the special merit award in the county category of the 1975 national awards program of Keep America Beautiful, Inc. (KAB).

The parish was cited for the many concentrated action programs of its "Let's Improve Franklin's Environment" (LIFE) program. The idea of the program began with the Northeast Soil and Water Conservation District (see October 1975 SOIL CONSERVATION). LIFE has grown from an effort to reduce the problems of litter and solid waste to a parish-wide force working in many environmental areas, including erosion control and recreation and wildlife area improvement, KAB noted.

LIFE is cosponsored by the Northeast Soil and Water Conservation District and the Parish Chamber of Commerce. ♦

H. H. Finnell—Pioneer in Wind Erosion Control Research

“He preached two things: know how to save rain; know how to use rain,” reported the Pawhuska Daily Journal-Capital in Oklahoma.

The “preacher” is the late H. H. Finnell, a pioneer in wind erosion control research and originator of the wind erosion control action program in the Southern Great Plains.

Last fall, in a ceremony at Oklahoma State University, Mrs. Finnell presented the Finnell Collection to the library. The collection includes scientific papers, articles, and other work of one of the early leaders in wind erosion control research.

Finnell served as director of the Panhandle State Experiment Station in Oklahoma from 1925-1934, was director of the SCS Wind Erosion Control Demonstration Project in Dalhart, Texas, in 1935, and served as SCS regional conservator in Amarillo, Texas, from 1936-1942.

Also at the ceremony, the National Association of Conservation Districts (NACD) presented a plaque to Mrs. Finnell to commemorate the contribution Finnell made to research and wind erosion control. The plaque is on display at the

agronomy department of Oklahoma State.

The ceremony was sponsored

by Oklahoma State University, the Soil Conservation Society of America, NACD, and SCS. ♦

ARS Reports New Technique To Save Irrigation Water

A new technique for irrigating bean plants in early stages of growth can cut water use by half—as well as reduce soil losses by furrow erosion and runoff.

That’s the report from the Agricultural Research Service where a soil scientist and an agricultural engineer at the Snake River Conservation Research Center in Kimberly, Idaho, have worked out a multiset surface irrigation system to small lister-type furrows.

The researchers used an ordinary surface planter to seed beans into the deep furrows several days after the preplanting irrigation. Frequent, light irrigations were then applied directly around the beans growing in the lister furrows. At the last cultivation, standard irriga-

tion furrows were reformed in the centers between the rows of bean plants and irrigated in a conventional manner until harvest.

In total, 14 to 16 inches of water were applied to the bean plants each season using this new technique. Conventional irrigation methods average 22 to 28 inches of irrigation water each season.

Fishing Award

The Sport Fishing Institute has presented a commendation award to the Soil Conservation Service for its contribution “toward the future of sport fishing.” The award cited SCS’s participation in the First National Bass Symposium in Tulsa, Oklahoma, last year.

Reviews

Forests For Whom And For What? Marion Clawson. 1975. Published for Resources for the Future, Inc. by The Johns Hopkins University Press, Baltimore and London. 175 pp., \$11.95 cloth, \$3.65 paper.

Marion Clawson writes as he speaks—in a quiet, factual, unassuming, but powerful manner. He approaches his subject methodically and without display of emotion or bias.

After a discussion of the policy issues which must be faced, he lays out a framework for analysis by naming the five criteria against which policy decisions must be weighed. These are physical and biological feasibility, economic efficiency, social welfare, cultural acceptability, and operational practicality. He recognizes that the five criteria cannot be weighed individually and so he adds a sixth—the satisfactory integration of the first five.

Too many of those who hold forth on forest policy are concerned with only one aspect of forest use, such as wood production or wilderness. Clawson speaks with equal concern for seven principal uses of forests—attractive environment, recreation, wilderness, wildlife, watershed, general conservation, and wood production.

In the last chapter he gives his conclusions on the major forest pol-

icy issues. He stresses the need for flexibility, the importance of recognizing the land's productivity potential as a base for policy decisions, and the necessity for accepting a mix of uses on most lands.

There is subject matter for serious thinking in this small book—**William J. Lloyd, Chief Forester, SCS, Washington, D.C.**

Sedimentation Engineering. 1975. American Society of Civil Engineers, 345 East 47th Street, New York, N.Y. 10017. 745 pp., illus. \$30.

This comprehensive publication deals with sediment and sedimentation problems encountered in the development, use, control, and conservation of land and water resources. The aim of its authors is to give concerned persons a better understanding of the nature and scope of sedimentation problems, proven and available methods of investigation, and of practical approaches to the solution of such problems. The seven major sections of this 800-page book present in-depth coverage of:

- Nature of Sedimentation Problems
- Sediment Transportation Mechanics

- Sediment Measurement Techniques
- Sediment Sources and Yields
- Sediment Control Methods
- Economic Aspects of Sedimentation
- American Sedimentation Law and Physical Processes.

Three extensive appendices are devoted to pertinent information sources and to design and operational data. Detailed subject and author indices are provided for easy access to desired information.

This long-awaited manual was prepared under the supervision of the Task Committee for the Preparation of the Manual on Sedimentation of the Sedimentation Committee of the Hydraulics Division of the American Society of Civil Engineers. The idea for the work was conceived by the late Carl B. Brown, SCS, in 1949 when he was the first chairman of the Sedimentation Committee. Vito A. Vanoni assumed the responsibility for this work in 1954 when he was appointed chairman of the newly formed Task Committee. The text was prepared from the reports published in the ASCE Journal of the Hydraulics Division and the discussions of these reports.—**William F. Mildner, Geologist (Sedimentation), SCS, Hyattsville, Maryland.**

Soil surveys

Alabama

Escambia County. By Martin G. Mattox. 1975. Soil Conservation Service and Forest Service in cooperation with Alabama Department of Agriculture and Industries and Alabama Agricultural Experiment Station. 98 pp., illus.; maps.

Minnesota

Nobles County. By Dale Lorenzen and Donald W. Calkins. 1975. Soil Conservation Service in cooperation with Minnesota Agricultural Experiment Station. 78 pp., illus.; maps.

North Carolina

Catawba County. By Edward O. Brewer. 1975. Soil Conservation Service in cooperation with North Carolina Agricultural Experiment Station. 48 pp., illus.; maps.

Puerto Rico

Mayaguez Area of Western Puerto Rico. By Roberto E. Gierbolini. 1975. Soil Conservation Service in cooperation with University of Puerto Rico, College of Agricultural Sciences. 296 pp., illus., maps.

Virginia

Henrico County. By John W. Clay. 1975. Soil Conservation Service in cooperation with Virginia Polytechnic Institute and State University. 119 pp., illus.; maps.

Meetings

March

25-27 *Northeastern and Southeastern Sections Annual Meeting of the Geological Society of America, Arlington, Va.*

28-

Apr. 2 *American Concrete Pipe Association, Coronado, Calif.*

April

4-6 *American Pulpwood Association, Atlanta, Ga.*

5-6 *"Air Pollution Standards and Indices" Conference, Toronto, Canada*

5-7 *Cordilleran Section Annual Meeting of the Geological Society of America, Pullman, Wash.*

6-8 *Great Plains Conservation Program Seminar on "Conflicts and Issues in Water Quality and Use," Denver, Colo.*

7-9 *Fourteenth Annual Symposium on Engineering Geology and Soils Engineering, Boise, Idaho*

7-10 *Association of Interpretive Naturalists Bicentennial Workshop, College Park, Md.*

11-14 *Association of American Geographers, New York, N.Y.*

11-16 *National Water Safety Congress, Overland Park, Kans.*

12-16 *American Geophysical Union, Washington, D.C.*

25-27 *Chamber of Commerce of the United States, Washington, D.C.*

26-28 *National Academy of Sciences, Washington, D.C.*

26-29 *International Hydrology Symposium, Bowling Green, Ky.*

28-

May 1 *North Central Section Annual Meeting of the Geological Society of America, Kalamazoo, Mich.*

May

2-5 *Annual Spring Meetings of the Hardwood Plywood Manufacturers Association, Scottsdale, Ariz.*

2-6 *American Institute of Architects, Philadelphia, Pa.*

9-12 *National Forest Products Association, Washington, D.C.*

19-21 *Twenty-seventh Annual Meeting of the Highway Geology Symposium, Orlando, Fla.*

20-21 *Rocky Mountain Section Annual Meeting of the Geological Society of America, Albuquerque, N. Mex.*

25-26 *National Soil Erosion Conference, Lafayette, Ind.*

30-

June 4 *American Institute of Biological Sciences, New Orleans, La.*

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U. S. Department of Agriculture / Soil Conservation Service / April 1976



Investment in the Future

Without doubt, preparing environmental impact statements has slowed or altered more watershed projects and resource conservation and development measures than any single legislative action in our 40-year history. We have had to pause and reflect . . . to strengthen our environmental assessments . . . to "shore up" some planning procedures. But we are turning out better plans for it.

When the National Environmental Policy Act (NEPA) was passed in 1969, SCS organized a task force to develop procedures for incorporating NEPA requirements into SCS programs. We built up our staff in key technical disciplines. We created an Environmental Services Division in Washington and hired environmental specialists in the technical service centers and many state offices. We also set up special training programs in ecology and environmental sciences for our employees.

Today we provide sponsoring local organizations with much more complete information to enable them to study alternatives and to come up with environmentally sound projects.

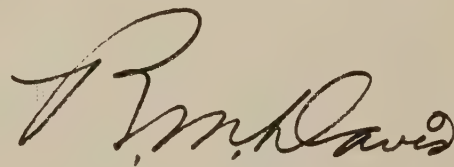
We try harder to involve interested environ-

mental groups and the general public. We publicize public meetings and hearings, mail information, and contact people personally. We help conservation districts and other sponsors plan with the entire community.

As more people become involved in our planning process, the environmental impact statement better serves its purpose as a document for decisionmaking. We talk to people, and their comments have a real impact on the statement before it becomes final. By then, it not only reflects decisions—it has helped make them.

We know that preparing environmental impact statements has strengthened the environmental and social aspects of our resource planning and brought them into better balance with economic and engineering goals.

We would be remiss not to note that, although the system is functioning smoothly, it is more costly in terms of dollars and manpower over the short run. But over the long run, when you add in the enhanced environmental values, it may well be our best investment in the country's future.

A handwritten signature in dark ink, appearing to read "J. M. Davis". The signature is fluid and cursive, with a large initial "J" and "M".

April 1976, Vol. 41, No. 9

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Earl L. Butz
Secretary of Agriculture

R. M. Davis, Administrator
Soil Conservation Service

Prepared in the Division of Information,
Soil Conservation Service,
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Contents

- 2 From the Administrator
- 4 Farm-City Project in Iowa Cuts Erosion and Flooding
Jim Allen
- 6 Calculating Conservation
John M. Cross
- 10 California's Unemployed Hired for Conservation Work
Robert E. Long
- 12 An Agricultural Service Center—
'More Than Several Offices Under One Roof'
Anne Zack
- 15 Speeding Up the Soil Survey
Don Manley
- 16 Selling Conservation With the Soil Loss Equation
John Maddy
- 18 The Periwinkle Measure
Joan Perry
- 20 Wildlife Makes a Comeback on Water Bank Farms
Charles G. Phillips
- 22 Soil Surveys
- 23 Meetings

COVER: A springtime view of Bridger Creek Valley in Montana with Bridger mountains in the background. With the warmer spring and summer temperatures, the melting snow on the mountains releases water used for irrigation, recreation, power production, municipal, and other uses. SCS snow surveys help predict the amount of water that will be available for these uses.

Farm-City Project in Iowa Cuts Erosion and Flooding

by Jim Allen

District conservationist, SCS, Charles City, Iowa

Three years ago, a 2- or 3-inch rain would swell Hyers Creek near Charles City, Iowa, and spill floodwaters over homes and one of the largest industries in the city.

"If a heavy rain came during the night you just waited for a phone call from the night shift asking what they should do about floodwater coming into the plant," says Al Culbert of White Farm Equipment.

Besides damaging the plant, which employs 3,000 people, floodwaters surrounded homes in the northern part of the city and brought in sediment and other debris. The city was forced to do annual maintenance work on storm sewers

and to install larger than normal pipes.

Meanwhile, more intensive rowcropping by farmers in the Hyers Creek drainage areas was causing increased soil erosion and adding to the flooding problem.

Now all that is changing. Local citizens got together 2 years ago to develop a 5-year plan to build tile outlet terraces to provide erosion control and reduce sedimentation and flooding in the 3,000-acre drainage area.

Most of the money for the project is coming from the Agricultural Stabilization and Conservation Service, White Motor Company, Charles City,

Floyd County, the Floyd Soil Conservation District, and rural landowners in the watershed.

First thoughts of the project started in 1960 when Councilman Clarence Gage and the late Ivan Salmons of the Soil Conservation Service began laying the groundwork. At that time, Iowa law would not allow the city to finance projects outside the city limits.

But the Iowa Code was changed 5 years ago, and the door was opened for the beginning of the project. When finished, about a half million dollars' worth of terracing and tiling will provide needed drainage for the 3,000-acre watershed.

Planning for the work was done by a watershed committee of representatives of the city council, Floyd County Board of Supervisors, White Farm Equipment, Walsh Manufacturing Company, and farmers in the watershed. They called the project the Washington School Watershed Project.

As part of the 5-year plan, committee members decided to build tile outlet terraces to control flooding and erosion. The planned approach is to build the terraces first in the subsheds (smaller drainage areas) that would reduce flooding the most. The committee identified eight priority areas in the watershed.

The 150-acre White Subshed was the first undertaking. Just east of White Farm Equipment, it needed 5,000 feet of terraces and 5,000 feet of tile. White Farm Equipment, Charles City, and Floyd County shared the cost equally, leaving no cost for the farmers involved.

Next in line was the 605-acre Priority Area Number 1, which needed 6 miles of terraces and 5 miles of tile. Total cost was

about \$70,000. The local Agricultural Stabilization and Conservation Committee obligated federal cost-share funds. The seven landowners involved agreed to pay \$27 per acre. Floyd County, Charles City, White Farm Equipment, Walsh Manufacturing, and the Floyd County Soil Conservation District also contributed substantially.

The terrace work will soon be complete in the White Subshed and Priority Area 1. Funds have already been committed for Priority Area 2, a 260-acre tract. A breakdown of funding for this subshed shows Charles City picking up the largest share. Floyd County, White Farm Equipment, and the landowners are each contributing substantially, and the Floyd County Soil Conservation District has also allocated funds.

There is still much to be done before the project is completed, but the terraces are already protecting the city. Charles City officials said possible flooding from rains last year was checked by the terraces already built.

Councilman Gage, one of the pioneers of the project, looks for both short- and long-term positive effects. "Within 15 years' time, the rewards from this project will far outweigh the costs, with the elimination of flooding of homes and industry in the area, reduced maintenance costs to city improvements, and a reduction in the cost of planned storm sewers in the area.

"And everyone knows the value of our rich Iowa soils—these terraces will keep it where it belongs, enabling food and fiber production for years to come.

"The sincere spirit of cooperation that has developed in Charles City between industry, city, agriculture, and government will have lasting effects," he said.

Floyd County SCD Chairman Jack Ruzicka agrees. "It's one of the many examples in Iowa pointing out how soil and water conservation benefits everyone. It shows that a concerted effort by rural and urban interests can solve mutual problems," he said. ♦

Snow lines the backslope of tile outlet terraces near Charles City, Iowa. The terraces are part of a \$500,000 local project to provide erosion control on farmland and reduce sedimentation and flooding in the city.



Calculating Conservation

by John M. Cross

Head, Information Unit, Midwest Technical Service Center, SCS, Lincoln, Nebraska

If you want to know whether conservation irrigation pays, get your banker to figure it for you. Bankers are realists, and when they are involved in farm management, every penny counts.

A prime example is the Peterson Estate, managed by the National Bank of Commerce

(NBC) of Lincoln, Nebraska. The owner's will stipulated the arrangement with NBC.

Today, Harold Buss leases 775 acres of the trust farm in Hall and Adams counties, and NBC Management Agent Keith Carlson, of Kearney, has helped him get started on an irrigation system. Complete accounting

records at fingertip reveal some interesting figures.

Part of the farm lies just south of the Platte River near Grand Island, where the Kennesaw silt loam soils are fairly young, as soils are figured—the loess materials are only about 10,000 years old. Whether there was ground water

This well-protected ditch brings irrigation tailwater from the end of corn rows back into a recovery pit for reuse in irrigating corn.



there and where, how these young soils would respond, how much would it cost to get the land ready—all these questions arose in the planning stage. Buss and Carlson, with help from Harold Klingman, district conservationist with the Soil Conservation Service, did some thorough calculating.

A couple of test wells didn't look too promising. Then a "water witcher" found water 800 feet west of one of the tests. This farm now has a 10-inch well drilled 170 feet deep and can produce 2,100 gallons per minute.

Irrigation is more than just

water, however, so there were other things to do. The next step was to level 195 acres of land around the well so that row grades and water management facilities could be installed. They moved 112,609 cubic yards of soil at a cost of \$16,891.35, about \$86 an acre.

"The trust department had

Harold Klingman, SCS district conservationist, Harold Buss, operator, and Keith Carlson, trust manager for the National Bank of Commerce, look at the junction of the main feeder line for irrigating corn.



to sell some stocks and bonds at a discount to raise the money, but it was a good move," said Keith Carlson.

Fourteen-hundred gallons per minute are pumped by a 100-horsepower electric motor and delivered 410 feet to the lines through a 10-inch underground pipe. There the water is divided and feeds three mains taking it to gated pipes at the upper ends of the rows. Minimum grades of 0.2 of a foot per 100 feet make it flow through and

out the other end of the row. Some runs are half a mile long.

On many irrigated farms the story ends there. But not on the Peterson trust farm.

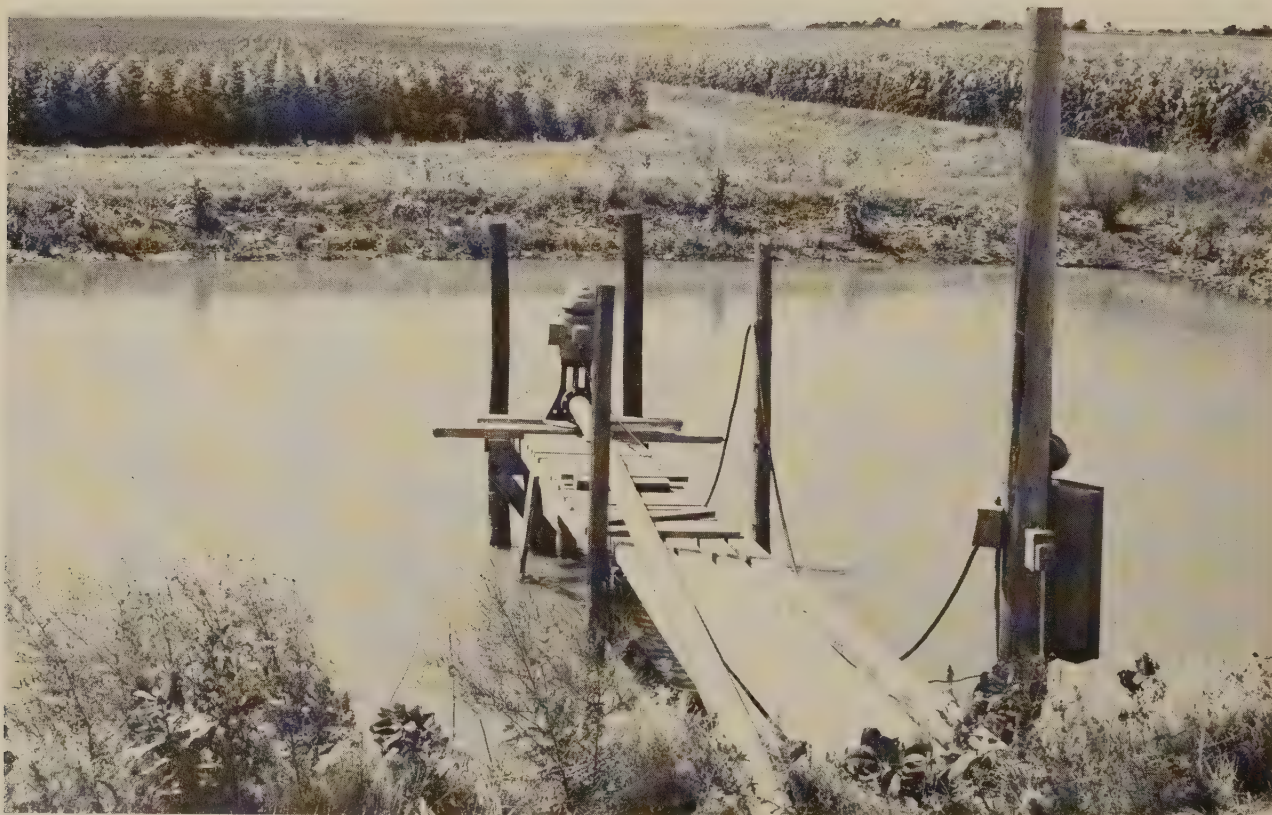
Gravity irrigation normally produces an outflow at the ends of the rows—tailwater, farmers call it. Uncontrolled, it can chisel away soil and pollute streams below. If a rainstorm comes during or soon after irrigation, the runoff water swells the tailwater volume and multiplies the damages. So Carlson, Buss, and Klingman planned

ahead for every drop to be used if possible.

Grassed drainageways catch tailwater and storm runoff at the ends of the rows and take it to a reuse pit carefully designed and strategically placed. The pit will hold 3 acre-feet (about a million gallons) of water that would be wasted, might damage a neighbor's field, or pollute a stream. Besides that it costs money to pump it out of the well.

"Klingman convinced us this ought to be a part of our sys-

The tailwater recovery pit is equipped with an automatic pump to feed reuse water back into main irrigation lines.



tem, and we are sure glad he did," said Carlson.

Yet there is often some free water in the tailwater pit. "It will hold the runoff of a 1½-inch rain easily," said Buss, and it stays there until needed. Pumping it back into the lines with a 7½-horsepower electric motor is much cheaper than pumping from the well. The cost of the pit, with its pump, motor, and platform was \$2,-317.71. But it is used to irrigate another 60 acres. Pretty cheap water.

"We were pretty leery that our well would take care of nearly 200 acres of corn in July and August some years in Nebraska," Carlson remembers, "but it is amazing how much confidence having that reuse water gives us." Now, where it will apply, every farm the bank helps develop for gravity irrigation will have a reuse pit on it. Carlson manages 61 farms for the bank. The bank has six other managers.

Klingman and his crew figure 65 percent efficiency from the water if they pump 1,400 gallons per minute from the well. But the tailwater pit increases the calculations to 85 percent. The pit provides about one-third of the total water requirement.

In 1970, the first year of operation after the irrigation system was installed, corn yields were only 96 bushels an acre, due to problems in getting a stand. In 1971 hail reduced the yield about 18 percent, to only

118 bushels at 15.5 percent moisture. The 1972 crop averaged 175, with one 5-acre plot going 194. The yield per acre averaged 162 bushels in 1973; 164 bushels in 1974; and 152 bushels in 1975. They fertilize according to random soil sampling, when fertilizer is available, at a cost averaging about \$31 an acre.

Dryland corn in the same area yields about 60 to 80 bushels an acre. So taking a 6-year average on the Peterson farm, the yield would be 144.5 bushels, or about double the dryland yields.

Total cost of the irrigation system was \$154.19 an acre for the well, leveling, half interest in 1,320 feet of pipe, and all underground lines. Add \$9.08 an acre for the cost of the reuse pit, and it comes to \$163.27. At \$3 a bushel, it only takes 54½ extra bushels of corn per acre to pay for the cost of the system.

But the bank adds another long-term benefit. Undeveloped land nearby sells for about \$800 an acre. Fully developed for irrigation, it sells for \$1,500. The bank's original evaluation of the land at the time it was developed was \$650. Irrigation development more than doubled that figure.

There are other benefits, too. Labor to operate the system amounts to about 1½ hours a day for Buss and his son. Again the tailwater pit comes in handy. "If the pit starts filling

up, we know we are getting water through and about how much," Buss said.

Mrs. Buss recalled that a neighbor came over one day and asked, "Won't you please let a little of your tailwater come through—we need it. We'll even pay for it." The system must be working, the Busses decided.

In the fall of 1972 they leveled another 160 acres, moving about 144,410 cubic yards. Harold Buss showed us his new reuse pit for this acreage. By placing the pit along a public road, the tailwater is brought across and used to irrigate another 55 acres, with cheaper—some free—water. Those prices make Carlson and the bank, and Harold Buss, very happy.

Careful accounting is required in trust as well as agent-managed operations. If the bank is convinced by its figures that a complete irrigation system, including recovery of tailwater, is a paying proposition, it must be. Yet, the bank isn't overlooking the soil saving aspects.

Water savings from a reuse pit can be calculated pretty closely. But how do you put a figure on reducing sediment from streams, halting erosion from runaway water, or damaging a neighbor's property? The National Bank of Commerce and Harold Buss know the value—they just don't try to run it through the electronic calculator. ♦

California's Unemployed Hired for Conservation Work

by Robert E. Long
District conservationist, SCS,
Jackson, California



Conservation crews clear brush along miles of streambank in Amador County.

When you're cold, hungry, and broke, conserving California's natural resources probably wouldn't be one of your immediate concerns. Especially if it costs you money. But for several hundred of the state's unemployed, conservation is not only a concern, but a way to earn a living.

Like the Civilian Conservation Corps and the Work Projects Administration workers of the 1930's, many of California's unemployed are working on conservation projects for money.

The projects include restoring recreation areas, clearing streams, stabilizing banks and roadsides, and developing outdoor classrooms. The work is authorized under Title X, Job Opportunities Program, of the Emergency Jobs and Unemployment Assistance Act of 1974.

Federal agencies in California have received an estimated \$18 million from the U.S. Department of Commerce for the program. More than 4,000 temporary jobs are expected to be

created before the program expires in March 1977.

Most of the money to be used on conservation projects has gone to the U.S. Department of Agriculture's Soil Conservation Service (SCS) and Forest Service. These agencies are channeling money through local units of government to create conservation projects that will employ people in rural areas.

George Stone, state conservationist for the SCS in California, said that his agency has been allocated \$1,660,500 for the Title X program. So far, he said, SCS has distributed \$1,065,000 through resource conservation districts and county governments to hire more than 380 persons since the program started in July 1975. The counties which have received Title X money from SCS include Amador, Sierra, Nevada, Placer, El Dorado, Lassen, and Mendocino.

According to Stone, the emergency jobs program is working for several reasons.

"The money is used in counties with high unemployment rates," he said. "No more than 25 percent of funds spent on a specific project can be used for materials. The other 75 percent goes directly toward labor.

"And last, but not least," Stone said, "the projects are selected on the basis of long-term employment and community benefits which they can provide."

In most cases, projects are requested by local associations, special interest groups, cities, and districts in the counties which have received Title X funds. The project requests are submitted to a resource conservation district within the county. The district's board of directors determines if the project is acceptable, and, if so, what its scope will be and how much money will be spent on it.

If the project is approved, the county administration department advertises the job openings and hires a crew. All employees hired under the Title



Kennedy Tailing Wheels, a proposed national historic park near Jackson, is being restored by conservation crews.



The crews are also restoring a 100-year-old, one-room schoolhouse to be a recreational facility in California. (Photo by Mike Doran)

X program receive county wages. Employees hired under the program include a project manager, who supervises all projects within a county, and a site foreman, who oversees on-site work.

The reception of conservation crews in the rural areas has been an enthusiastic one. Community members have donated money for materials, their own time and labor, and have even offered refreshments for the crew members after they have completed their projects. According to the Mayor of Lone, a town in Amador County, "the residents of the city will reap the benefits of the crew's conservation effort for years to come."

In Amador County alone, SCS distributed \$252,000 to be spent on conservation projects. Approximately 75 persons have been hired to work on the projects.

Mike Doran, project manager for the Amador County projects, explained that there are 15 conservation categories under Title X work. Amador County was assigned recreation, outdoor classrooms, and streambank stabilization.

One of the major projects includes the development of a 5-acre classroom at Jackson Elementary School. A crew of five persons is clearing out a heavy growth of blackberries without disturbing the remaining natural vegetation.

Plans for the outdoor classroom include a pond, improved trails, an observation area, plantings for wildlife, a greenhouse, weather station, and garden.

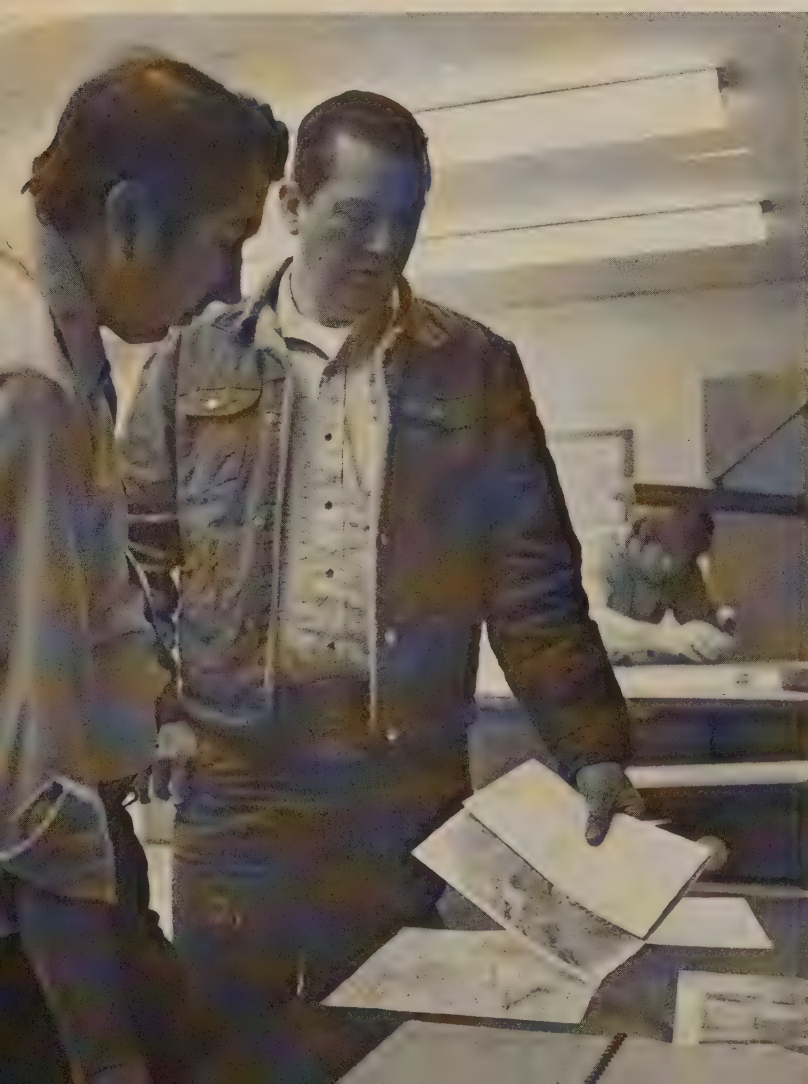
Another major project in Amador County is the restoration of Kennedy Tailing Wheels Park. The 7-acre park, located near Jackson, is a historic site which attracts busloads of tourists

in the summer. Huge waterwheels were constructed on the park grounds in the gold rush days. The wheels were used to run tailing water uphill from a gold mine to a settling pond.

Other projects in the county range from clearing miles of streams to restoring several 100-year-old one-room schoolhouses for use as recreation facilities.

"A lot of projects being done under Title X had been proposed for many years, but the communities never had the people or funds to get them started," Frank Dal Porto, Jr., president of Amador County Resource Conservation District, said. "That's why they are anxious to see this program continue."

"Now, a lot of people have jobs that pay well and are worth working on. And that's the whole purpose of the program." ♦

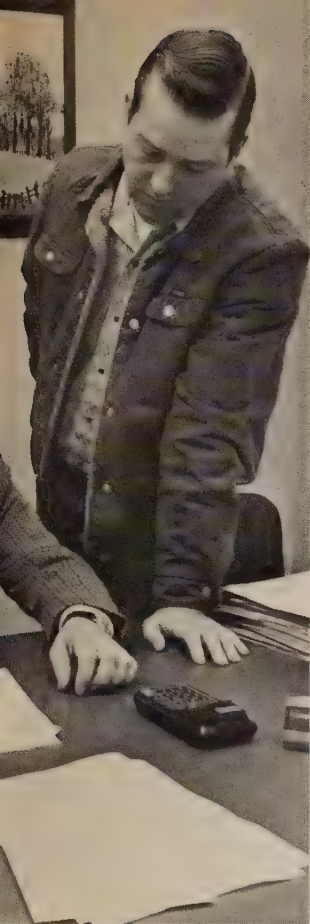


An Agricultural Service Center— 'More Than Several Offices Under One Roof'

by Anne Zack
Information Division, SCS, Washington, D.C.

Public response shows agricultural service centers, like the one in Ripley, West Virginia, help USDA agencies provide better service to people and increase efficiency.

"We're real busy on the farm," said Bill Raines of Ripley, "and it's not too often that we get bad weather or some other break in the work so I can get



to town. Now that all these offices are in one place, I can spend about 4 hours and get everything taken care of instead of wasting time driving from one office to the next."

Carl Stone, chairman of the Agricultural Stabilization and Conservation Service (ASCS) county committee, pointed out another convenience. "When the committee meets in the conference room to decide where to put money for specific practices, we can call in people from the Soil Conservation Service (SCS) and Farmers Home Administration (FmHA) for information because they're right here. To me, that's the beauty of this setup."

Most agricultural service centers house local offices of the ASCS, FmHA, and SCS, and some include the Federal Crop

Insurance Corporation, Extension Service, conservation district, and other federal, state, and local offices as well.

A service center, however, is more than several offices under one roof. One individual provides reception services for all the USDA agencies. They share one telephone system as a convenience to the public. They share equipment and such facilities as a conference room and storage space to cut government expense, and they share files and information to save the time and effort of duplicating work already completed. The open space design of most service centers also leads to more interaction among the agencies.

As of the first of March, 130 service centers were in operation across the country, and

In top left photo, Sue Itnyre greets Bill Raines as he visits the agricultural service center in Ripley, West Virginia. Sue greets all visitors and answers all incoming calls. She is familiar with the programs of all three agencies at the service center so that she can answer questions and direct land users to the agency they need.

In center photo, Jerry Teter, county supervisor for the Farmers Home Administration, checks the status of Raines' loan for farmland improvements. Each agency has an enclosed office where land users can discuss their business in private.

Above, Raines talks with Jerry Tephabock, ASCS county executive director, as program assistant Virginia Illnecke fills out Raines' request for cost sharing.

In bottom photo, Fletch Conley, SCS project engineer for the Mill Creek Watershed Project, discusses with Raines the recent investigation of a site on Raines' farm for a proposed flood control structure. The watershed project office has extra space for drafting tables and a "mud" room.

plans for 899 more sites have been designated by USDA.

The agricultural service center in Ripley was one of the first in the country. It serves the people of Jackson County, north of Charleston on the Ohio River. Its design and operation are typical of most agricultural service centers. ♦

At right, SCS District Conservationist Larry Sturm discusses Raines' conservation plan with him. "Everything considered," Sturm says, "the agricultural service center concept is a fine one. Its advantages are overwhelming; its disadvantages are few."

Although the people who work there agree that the service center functions well, there always have to be some compromises because of the open space design. Every 2 weeks the entire staff meets in the conference room to discuss how operations of the service center might be improved.



Speeding Up the Soil Survey

by Don Manley

District conservationist, SCS, Clinton, North Carolina

The residents of North Carolina's largest county aren't about to give up on their progressive soil survey.

The survey got off to a good start in 1973. Farmers and city people—plus officials of local government—wanted Sampson County's 616,020 acres mapped to help them make wise land use decisions. The county provided additional funds to accelerate the survey by the Soil Conservation Service (SCS).

SCS soil scientist Phil Tant was joined by an Extension Service soil scientist who was paid by county funds. Their work was supervised by Leslie Barnhill of nearby Goldsboro, SCS soil scientist for the area.

But a catch came when the employee paid by county funds left for a new job in California last year. About one-fourth of the county had been mapped, and residents soon could see their survey slowing up.

At a public meeting, a good many people voiced strong support for the survey.

Brantley Sutton of Suttontown, chairman of the Sampson County Planning Board, told how the planners needed the survey for wise land use decisions. All the supervisors of the Sampson Soil and Water Conservation District, headed by

Chairman James H. Ware of Turkey, came to support the survey.

James F. Honeycutt of Clinton represented the county commissioners, who were so strong for the survey that they had provided \$12,000 a year to support it.

"My farm has been mapped, and it has already provided

many advantages. I depend on this soils data for making decisions about planting crops, and what to do with the land I have," said Tom Newman, former chairman of the Sampson County Board of Commissioners.

Another strong supporter was Bill Shaw, sanitarian supervisor with the Sampson County Health Department. The survey "helps us decide which areas will take septic tanks, which land is most suitable for development, and other decisions. We consider the survey a vital tool for public health," he said.

Clyde Thompson, area forester for the North Carolina Forest Service, testified that the survey data "is needed to help us determine cutting cycles, tree planting practices, and many other woodland decisions. This soil data is not just useful, it's vital."

After the meeting was over, nobody had much doubt that the survey would continue to move ahead.

The Sampson County Board of Commissioners voted to increase its financial support to \$14,000 a year. A new soil scientist, Jim Lemly, was hired and is busy mapping.

Six preliminary surveys in all parts of the county have been published from data gathered in the first year. Both urban people and farmers are already utilizing the data now on hand.

Nobody in Sampson County wants to let up until the whole county is completed—when residents will have the largest soil survey in North Carolina. ♦



SCS soil scientist Phil Tant maps soils in a field of bell pepper in Sampson County, North Carolina.

Selling Conservation

by John Maddy
Agronomist, SCS, Des Moines, Iowa

One of the most useful tools for any soil conservationist is the Universal Soil Loss Equation. It's invaluable as a technical tool to determine soil losses. Taken a step further, that technical tool can be equally valuable as a selling tool for conservation practices.

The equation proves there is a soil loss and provides alternatives needed to control it. It helps give the landowner a flexible plan to protect his soil resources and get an economical return on his investment.

Soil conservationists came up with the equation, $A = RKLSCP$, after nearly 10,000 plot years of data and rainfall records from 2,000 weather stations in 37 states. It's used to predict the average annual soil loss that can be expected from a certain soil over a number of years.

On one side of the equation, '**A**' represents the predicted average annual soil loss, in tons of soil, from 1 acre of land. This figure is reached by multiplying factors from the right side of the equation.

'**R**' is the rainfall factor; it reflects the average annual erosion-producing rainfall.

'**K**' is the soil erodibility factor; it tells how easily each soil will erode when rain falls on fallowed ground.

'**L**' is the length and '**S**' is the steepness of the slope. These two factors are combined because of their close interactions.

The '**C**' factor is for cropping and management. The computation of this factor is very complex because it involves many areas of crop and soil management. It takes into consideration the combined effects of the type of crop, cultural methods, tillage methods, and extent of crop residue.

'**P**' is the conservation practice factor, specifically contouring or stripcropping.

Let's look at an actual example of how the equation can be used to sell conservation. Say a farmer has a crop field with Marshall silt loam soils, one of the largest soil associations in

Iowa. The soil erodibility factor '**K**' is .32. The '**K**' factor in Iowa ranges from .17, the least erodible soil, to .49, a highly erodible soil. The rainfall factor '**R**' is 175 for most of Iowa.

Let's also say the farmer has long 400-foot slopes with a steepness of 6 percent. The **LS** factor for that slope is 1.4. Further, the farmer is planting continuous corn after plowing in the fall. SCS technical guides give continuous corn plowed in the fall a '**C**' factor of .41. The farmer is also plowing up and down hill, giving us a '**P**' factor of 1.0. By multiplying all these figures together, we can tell this farmer what he can expect in the way of soil losses each year.

R	K	LS	C	P	= A
175	.32	1.4	.41	1.0	= 32 tons/acre

Every Soil Conservation Service field office has the information needed for computing soil losses using the equation.

A whopping 32 tons an acre! That's about an inch of topsoil lost every 5 years—too much soil loss to maintain a permanently productive field.

The next step is to use the equation to show the farmer what he can do to reduce soil losses. He can't change his soil type or annual rainfall; but he can change the direction he farms, his method of tillage, and the length of his field slopes.

One of the first alternatives would be to stop farming up and down hill. Contouring changes the '**P**' factor to .5 and reduces his soil losses to 16 tons an acre. Since his slopes are long, terracing is another alternative. Terracing at the recommended 130-foot spacings reduces the soil loss to about 5.6 tons an acre. If the farmer

With the Soil Loss Equation

decides to spring plow instead of fall plow, his soil loss is reduced even more, to 4.8 tons an acre. Better yet, if he were to chisel plow or use some other tillage machine to leave 3,000 to 4,000 pounds of the previous year's cornstalk residue on top of the ground, he would reduce soil losses to 2.4 tons an acre.

If the farmer did all the things mentioned above, his figures in the equation would become:

$$\begin{array}{ccccccccc} \mathbf{R} & \mathbf{K} & \mathbf{LS} & \mathbf{C} & \mathbf{P} & = & \mathbf{A} \\ 175 & .32 & .47 & .18 & .5 & = & 2.4 \text{ tons/acre} \end{array}$$

Stripcropping and crop rotations could also be erosion control alternatives. It's the farmer's decision on how many practices and which combinations to use. It's the conservationist's responsibility and opportunity to point out how well each combination will control erosion. So the conservationist uses the equation as both a basic technical tool and as a selling tool. Every Soil Conservation Service field office has the information needed for computing soil losses using the equation.

Soil conservation districts (SCD's) in Iowa rely on the soil loss equation to administer a state law.

... the farmer with a 13-ton-per-acre soil loss is losing 2 bushels of soil for every bushel of corn he produces.

The 1971 Iowa Conservancy Act, which encourages and promotes conservation of soil and water, called on SCD's to set soil loss limits for each soil in Iowa. Complaints of sediment damage resulting from excessive erosion occurring on someone else's land are filed in

Formula Facts

The use of formulas to predict soil loss began nearly 30 years ago.

Dr. George Browning introduced what was known as the Browning factors in the mid-1940's. An early researcher in soil conservation work, he compiled factors and tables to predict soil loss from water erosion.

The Musgrave formula followed. All have been revised and improved as more research information was obtained.

The Universal Soil Loss Equation now in use was compiled and released by Walter H. Wischmeyer and Dwight D. Smith of the USDA Agricultural Research Service in 1965.

writing to the local districts. District commissioners investigate the complaints to determine if the soil loss limits (they range from 3 to 5 tons per acre) are being exceeded. If the soil loss does exceed the limit for that type soil, the landowner must use an alternative practice in order to stay within the law. Soil conservation districts give financial and technical help.

A translation of the soil loss equation results may help sell soil conservation to farmers. Results are listed in tons per acre. Many farmers can more easily understand what a bushel is than what a ton is. Since a bushel of soil weighs about 100 pounds, a ton of soil loss is 20 bushels. A 13-ton-per-acre loss each year (260 bushels) is more than twice the average corn yields in Iowa. Using those terms, the farmer with a 13-ton-per-acre soil loss is losing 2 bushels of soil for every bushel of corn he produces. ♦

The Periwinkle Measure

by Joan Perry

Soil conservationist, SCS, Portland, Oregon

Not long ago, Periwinkle Creek in Oregon was a persistent problem for farmers whose lands it flooded and a nuisance to residents of urbanizing Albany.

Today, it's a community asset.

Farmers and urbanites together approached the problem through the Upper Willamette Resource Conservation and Development area. They sponsored the Periwinkle Resource Conservation and Development Measure to provide flood control, drainage, and recreation opportunities to those who live in the area.

These sponsors—the East Linn Soil and Water Conservation District, Linn County, the City of Albany, and the Grand Prairie Water Control District—agreed that land treatment and channel work were badly needed to allow proper drainage and provide increased capacity during periods of heavy runoff.

The natural channels of the creek were too shallow to accommodate heavy runoff, and the narrow, brushy creek frequently overflowed. Roads and residential areas were often flooded.

As part of the measure, the Soil Conservation Service helped landowners develop conservation cropping systems



Floodwaters overran the streambed of Periwinkle Creek before work on the measure was started.

and improve pasture and hayland seeding and management. To regulate the ground water and reduce sediment and pollution from overland flows, tile drains are being installed on farms as part of the drainage activity in the measure.

The new Periwinkle channel follows a curving path through the city, expanding into two inviting lakes. Poplars and several large oak and cottonwood trees shade adjacent land.

The channel was built with two levels: one deep enough to contain a normal flow and one to contain a flow which might happen once in a hundred years. Along the wider upper channel level, grass, trees, and

shrubs were added as part of the park. A bicycle path has also been paved in this area.

Care was used during the construction period to avoid erosion of soil and production of sediment. The park area and channel banks were seeded soon after being shaped and were well established long before the park was finished.

The level of the two lakes is controlled by concrete dams which permit passage of winter floodflows and the upstream migration of fish.

Water from two upstream dams is used to increase low seasonal flows and improve the habitat for the cutthroat trout that spawn there in the winter

* Ms. Perry was formerly with SCS in Albany, Oregon.

and return to the Willamette in the spring.

The park plantings were designed by George Whitt, landscape architect for Albany, to emphasize natural colors and native vegetation. Native evergreens will screen the concrete patios leading to the footbridge spanning the channel. Vine maple and Oregon grape add red and yellow colors to the plantings.

On a spring day, you'll see the park in full use—a young woman walking her dog, obviously enjoying the grass and water which buffer the noise of nearby traffic . . . mallards swimming in the lakes . . . boys in T-shirts and blue jeans playing baseball and finding new ways to cross the creek . . . bicyclers using the paths designed especially for them.

The park has become a major recreation area in Albany—just one benefit of the Periwinkle Creek measure.

With channel work and land treatment, annual flooding has been reduced and drainage has been provided for waterlogged lands next to the creek.

For the farmers in the 4,480-acre watershed, it means more intensive land use, and new cropping alternatives are now possible.

Homes near the park are no longer as susceptible to flood damage. A public sewer system



A concrete dam controls the water level of a pond on Periwinkle Creek. The rocks in the foreground slow the velocity of spring flows and provide resting places for migrating fish. Below, a blower was used to mulch the two-level channel.



has replaced septic tanks in the urbanizing area, thereby eliminating concerns that ground water contamination might occur. The sanitary sewer system will extend service to urban and suburban areas east of Albany's city center.

In the Periwinkle Creek measure, integrated resource planning was the keystone. Through the cooperation of several agencies, tomorrow's resource needs were preserved while current problems were solved. ♦

Wildlife Makes a Comeback

On Water Bank Farms

by **Charles G. Phillips**

Soil conservationist, SCS, Washington, D. C.

A North Dakota farmer today observes a growing number of ducks, pheasants, and deer on his farm in the Central Flyway.

That farmer—Otto Rath of LaMoure County—has one of the 900 Water Bank Program (WBP) agreements in North Dakota and one of more than 2,900 in the nation to preserve and improve wetlands in the migratory waterfowl nesting and breeding areas.

Rath had observed a gradual decline in all kinds of wildlife, both upland and waterfowl, on his farm during the 1960's. In 1972, he developed a Water Bank Program agreement on 76 acres of his farm. This covered 17 acres of wetland and 59 acres of former cropland that was revegetated to provide cover for wildlife and protection from erosion.

Since then, wildlife has been returning to Rath's farm. Migratory waterfowl nest in the tall dense cover provided in the former cropland, now seeded to alfalfa, sweet clover, and wheatgrass. Upland wildlife, such as pheasants, also find

food and cover in these fields. Rath has observed 50 pheasants using the slough area and finds deer use the area more now than when it was in crops. Previously, this cropland was harvested each fall and a minimum of crop residue was left over the winter.

When one of the most severe blizzards experienced in LaMoure County hit on January 10, 1975, Rath found no visible loss of wildlife. The tall dense vegetation left in the former cropland had protected the area from snow drift, and strong winds had had little effect.

North Dakota had nearly 900 contracts under the Water Bank Program as of January 30, 1975. These agreements cover more than 91,000 acres. Nationally, the more than 2,900 Water Bank Program agreements cover nearly 250,000 acres being improved and protected for wildlife habitat.

The average agreement contains 29 acres of wetlands and 55 acres of adjacent lands. The average annual payment is about \$9 per acre or more than

\$725 per program participant each year for a 10-year period.

The Water Bank Program is available in 72 counties in the states of Arkansas, California, Louisiana, Maine, Michigan, Minnesota, Mississippi, Montana, Nebraska, North Dakota, Oregon, South Dakota, Vermont, Washington, and Wisconsin. Fifty-two of the 72 counties are in Minnesota, North Dakota, and South Dakota, concentrated primarily in the Mississippi and Central Flyways. California, Oregon, and Washington are in the Pacific Flyway while Maine and Vermont are in the Atlantic Flyway.

The Water Bank Program was authorized by the Water Bank Act, Public Law 91-559, on December 19, 1970, to prevent serious loss of wetlands, preserve present wetlands, and restore and improve wetlands in the migratory waterfowl nesting and breeding areas. The Act directed the Secretary of Agriculture to effectuate the program by entering into long-term agreements with landowners and operators in important waterfowl areas.



The WBP agreement is based on a conservation plan for the entire operating unit developed with assistance from the Soil Conservation Service in cooperation with the local conservation district. The Agricultural Stabilization and Conservation Service (ASCS) administers the program by accepting requests, developing agreements, and making annual payments.

SCS provides technical assistance in developing a conservation plan covering the participant's entire operating unit. SCS provides related technical assistance involving:

- Identifying Type 3, 4, and 5 wetlands and adjacent lands to be developed or preserved for wildlife on the plan map and identifying the area in the field by corner markers.

- Applying needed conservation practices to protect and improve wetlands and designated adjacent lands.

- Providing followthrough assistance to insure appropriate protection of wetlands and adjacent lands and needed maintenance of conservation practices applied.

The conservation plan developed by the Water Bank Program participant with SCS assistance in cooperation with the local conservation district provides for:

- All land use and conservation treatment decisions, including the scheduling of practices, on the wetlands and designated adjacent areas covered by the WBP agreement.

- Either decisions or recommended conservation alternatives on the remainder of the operating unit.

- Installation and maintenance of planned conservation practices.

All conservation practices required to protect or improve the designated area in the WBP agreement must be installed and maintained to avoid termination of the agreement for noncompliance. Such terminations require the participant to refund all payments.

The conservation plan provides the basis for scheduling onsite technical assistance needed for the installation and maintenance of planned conservation practices in accord-

ance with acceptable technical standards and specifications.

Limited grazing of the designated acreage as a management practice to improve the waterfowl habitat can be approved. The State Development Group must unanimously approve limited grazing before it can be used within the state. Limited grazing must be carefully controlled and practiced in accordance with the specifications stated in the conservation plan.

Wetlands are generally referred to as marshes, swamps, bogs, wet meadows, potholes, sloughs, and river-overflow lands. Shallow lakes and ponds with emergent vegetation are included.

Many wetlands can be drained or filled to create land suitable for agricultural, industrial, residential, and other uses. Inland wetlands can be changed to deep water lakes by constructing an earthen fill.

As man tampers with natural wetlands, the food and cover plants required by waterfowl and other wetland wildlife may not survive. Just as the early

settler changed the land he found on this continent, man continues to destroy nature's wetlands, feeling that such "waste land" must be put to productive uses.

However, environmental awareness on the part of many segments of the general public within the past decade has helped to reverse this trend to exploit our resources, including wetlands.

Approximately 22 million acres of wetlands in the United States have moderate to high value for waterfowl, according to the U.S. Fish and Wildlife Service Circular 39. Of these 22 million acres, 9 million are Type 3, 4, or 5 wetlands.

Type 3 wetland is defined as inland shallow fresh marshes that are usually waterlogged during the growing season.

Type 3 and Type 4—inland deep fresh marshes—constitute the principal production areas for waterfowl.

Type 5—inland open freshwater—is made up of shallow ponds and reservoirs. Water is usually less than 10 feet deep and is fringed by a border of emergent vegetation. Type 5 wetland is often surrounded by or adjacent to Type 3 and Type 4 wetlands.

It is the policy of the Soil Conservation Service that technical assistance will not be furnished for draining Types 3 through 20 wetlands. Also, under the Agricultural Conservation Program, cost sharing is not available for draining Types 3 through 20 wetlands.

Many wildlife agencies and organizations have cooperated in the Water Bank Program. The U.S. Fish and Wildlife Service and the state wildlife agencies have contributed hundreds of man-hours, especially at the local level, in onsite reviews of proposed wetland areas. ♦

Soil surveys

Iowa

Worth County. By Russell L. Buckner and John D. Highland. 1976. Soil Conservation Service in cooperation with Iowa Agriculture and Home Economics Experiment Station, Cooperative Extension Service, Iowa State University, and the Department of Soil Conservation, State of Iowa. 121 pp., illus.; maps.

Mississippi

Lamar County. By Rex E. Davis and Kenneth H. Byers. 1975. Soil Conservation Service in cooperation with Mississippi Agricultural and Forestry Experiment Station. 43 pp., illus.; maps.

Montgomery County. By Abraham E. Thomas. 1975. Soil Conservation Service in cooperation with Mississippi Agricultural and Forestry Experiment Station. 50 pp., illus.; maps.

Montana

Dawson County. By Tommie J. Holder and Pedro Pescador, Jr. 1976. Soil Conservation Service in cooperation with Montana Agricultural Experiment Station. 72 pp., illus.; maps.

Nebraska

Cuming County. By Dean W. DaMoude, Donald Kerl, and Norman L. Slama. 1975. Soil Conservation Service in cooperation with University of Nebraska, Conservation and Survey Division. 69 pp., illus.; maps.

Dakota County. By Norman L. Slama, Donald E. Kerl, and Dean W. DaMoude. 1976. Soil Conservation Service in cooperation with University of Nebraska, Conservation and Survey Division. 91 pp., illus.; maps.

Douglas and Sarpy Counties. By Paul A. Bartlett. 1975. Soil Conservation Service in cooperation with University of Nebraska Conservation and Survey Division. 79 pp., illus.; maps.

New Mexico

Mescalero-Apache Area. By Raymond E. Neher. 1976. Soil Conservation Service and the United States Department of the Interior, Bureau of Indian Affairs, in cooperation with New Mexico Agricultural Experiment Station. 79 pp., illus.; maps.

White Sands Missile Range (Parts of Dona Ana, Lincoln, Otero, Sierra, and Socorro Counties). By Raymond E. Neher and Oran F. Bailey. 1976. Soil Conservation Service in cooperation with United States Department of the Army, White Sands Missile Range and the New Mexico Agricultural Experiment Station. 64 pp., illus.; maps.

North Dakota

Oliver County. By Paul K. Weiser. 1975. Soil Conservation Service in cooperation with North Dakota Agricultural Experiment Station. 121 pp., illus.; maps.

Meetings

Richland County and Sheyenne National Grassland Area of Ransom County. By Donald G. Thompson and Lloyd L. Joos. 1975. Soil Conservation Service and Forest Service in cooperation with North Dakota Agricultural Experiment Station. 141 pp., illus.; maps.

Texas

Lipscomb County. By Jack C. Williams. 1975. Soil Conservation Service in cooperation with Texas Agricultural Experiment Station. 66 pp., illus.; maps.

Wheeler County. By Jerald O. Crump and Jack C. Williams. 1975. Soil Conservation Service in cooperation with Texas Agricultural Experiment Station. 71 pp., illus.; maps.

Washington

Yakima Indian Reservation Irrigated Area (Part of Yakima County). By Jack J. Rasmussen. 1976. Soil Conservation Service, United States Department of the Interior, Bureau of Indian Affairs, in cooperation with Washington State Agricultural Experiment Station. 51 pp., illus.; maps.

Wyoming

Johnson County (Southern Part). By James R. Stephens, Jr. 1975. Soil Conservation Service in cooperation with Wyoming Agricultural Experiment Station. 156 pp., illus.; maps.

May

- 2-5 *Annual Spring Meetings of the Hardwood Plywood Manufacturers Association, Scottsdale, Ariz.*
- 2-6 *American Institute of Architects, Philadelphia, Pa.*
- 4-6 *Nineteenth Conference on Great Lakes Research, Guelph, Ontario, Canada*
- 9-12 *National Forest Products Association, Washington, D.C.*
- 9-14 *National Council of State Garden Clubs, Inc., Convention, Pittsburgh, Pa.*
- 19-21 *Twenty-seventh Annual Meeting of the Highway Geology Symposium, Orlando, Fla.*
- 20-21 *Rocky Mountain Section Annual Meeting of the Geological Society of America, Albuquerque, N. Mex.*
- 25-26 *National Soil Erosion Conference, Lafayette, Ind.*
- 30-
- June 4 *American Institute of Biological Sciences and Ecological Society of America, New Orleans, La.*

June

- 1-3 *"The Role of Phosphorus in Agriculture" Symposium, Muscle Shoals, Ala.*
- 3-4 *National Meeting of Keep America Beautiful, Inc., Dearborn, Mich.*
- 6-10 *American Society of Landscape Architects, San Diego, Calif.*
- 7-9 *American Plywood Association, Portland, Oreg.*
- 13-18 *Eighty-fifth Annual General Federation of Women's Clubs Convention, Philadelphia, Pa.*
- 20-25 *American Water Works Association Ninety-sixth Annual Conference, New Orleans, La.*
- 21-23 *Garden Club of America Sixty-third Annual Meeting, Minneapolis, Minn.*
- 26-30 *National Association of Counties, Salt Lake City, Utah*

26-

- July 1 *American Seed Trade Association, Inc., Convention, Los Angeles, Calif.*
- 27-29 *American Society of Farm Managers and Rural Appraisers Summer Meeting, Elizabethtown, Pa.*
- 27-30 *Sixty-ninth Annual Meeting of American Society of Agricultural Engineers, Lincoln, Nebr.*
- 27-30 *Twenty-third National Watershed Congress, Biloxi, Miss.*
- 27-

July 1

- July 1 *Air Pollution Control Association Sixty-ninth Annual Conference & Exhibition, Portland, Oreg.*
- 27-
- July 1 *Fortieth Annual Educational Conference of National Environmental Health Association, Nashville, Tenn.*

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Conservation

U.S. Department of Agriculture / Soil Conservation Service / May 1976



From the Administrator

Lessons on the Land

Some say it was like the thirties.

They saw dust storms again and covered fences and roadside ditches filled to the top with the fine, powdery soil.

But they didn't see, as we did in the thirties, families packing up and moving. Nor did they see some of the things we saw in the fifties, when ranchers in Texas were grinding up mesquite and mixing in molasses to feed their cattle.

We're having prolonged drought in parts of the Great Plains again and it may not be over yet. But we're nowhere near the thirties . . . there's no new Dust Bowl by a long shot. The conservation practices on the land reflect more than 40 years of research, application, and hard work.

During the spring blow season, much of the Great Plains was patterned with conservation practices to control wind erosion. Stubble mulching . . . minimum tillage . . . stripcropping . . . cover crops . . . all made their marks.

Rangeland also was in better condition than in the 1930's and 1950's. Not only are better management techniques being applied, but many more ranchers have a drought plan. When rainfall is low, many are prepared to

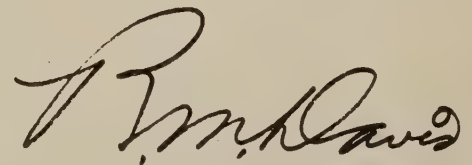
sell their cattle or put them on feed . . . and there is less overgrazing of pasture and rangeland.

Still, by the end of March, we found nearly 5.5 million acres in the Great Plains had been damaged by wind erosion since last November. More than 9 out of 10 of these acres were cropland. Another 1.9 million acres of crops or cover were destroyed.

By the end of March, 3 million acres in the Great Plains had escaped damage with the temporary protection of emergency tillage.

We'd like to have seen less soil damage. But the situation is far from a disaster. For almost every area, there is a conservation practice that can hold the soil in place. Still, this dry spell proves, more than ever, that some lands should never have been put under the plow in the Great Plains.

We've learned a lot of lessons from the land—too often the hard way. But we notice that after each drought, thanks to steadily expanding conservation practices and the Great Plains Conservation Program, the land is in better condition than it was after the last one. And that's encouraging.



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Earl L. Butz
Secretary of Agriculture

R. M. Davis, Administrator
Soil Conservation Service

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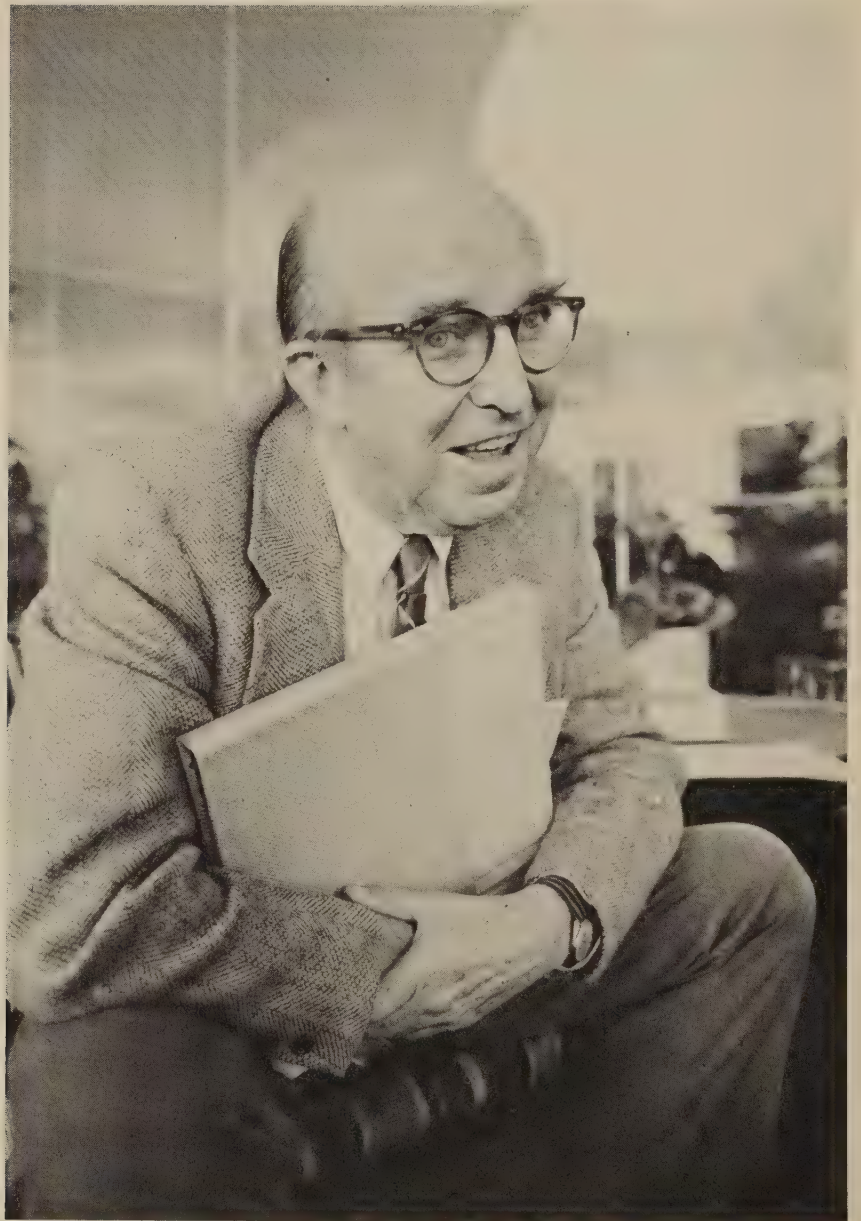
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Contents

- 2 From the Administrator
- 4 A New Town Plans for Quality of Life
Anne Zack
- 9 Hitting the Conservation Trail
John L. McLain and Wallace Peterson
- 12 Conservation Benefits at Blackwater
Don Schuhart and Shirley Foster Fields
- 15 Arkansas Wildlife Unlimited
Susie Harris
- 16 SCS Sponsors Workshop for Federal Women's Program
Coordinators
Anette M. Jenkins
- 18 Trout and Title X
Toy N. Campbell, Jr.
- 21 Achieving a Goal of Water Supply
Harold D. Heise and Ronald W. Hayes
- 23 Soil Surveys
- 23 Meetings

COVER: Canada geese take off at Blackwater National Wildlife Refuge on the eastern shore of Maryland. The wetland habitat at the refuge has been enhanced for migratory birds with a wildlife conservation plan begun 25 years ago by the U.S. Department of the Interior in cooperation with the Soil Conservation Service. (See story on page 13.)

A New Town Plans For Quality of Life



James W. Rouse talks of conservation planning at Columbia, Maryland.
(Photos by H. E. Alexander, Jr.)

Columbia, Maryland, has received national recognition as a successful new community—a rare achievement in recent years.

One reason for its success is the extensive research and planning which went into it, including studies not only of physical design but of social needs.

Located halfway between Baltimore and Washington, D.C., Columbia began in 1962 when The Rouse Company, headed by James W. Rouse, began researching and acquiring land. The company used natural resource data, including a soil survey and topographic survey, in its planning.

From the start of construction in 1966, The Rouse Company has worked closely with the Howard Soil Conservation District (SCD) to control erosion and sedimentation. In 1974,

the district named Rouse cooperator of the year.

Today, Columbia is a city of 40,000 people, with a projected population of more than 100,000. Houses and facilities are concentrated in neighborhoods and villages separated by lakes, parks, and open space. Seven of the 10 planned villages have been completed, and 10 elementary schools, 3 middle schools, and 2 high schools are in operation.

The city continues to attract planners from across the United States and around the world.

In an interview with Anne Zack of the Information Division, Soil Conservation Service, Rouse and Robert V. Young, manager of development services of The Rouse Company, discuss Columbia, now in its 10th year of operation.

Was the physical environment the main factor in designing Columbia?

Rouse: We went down two planning tracks at the same time—physical and social. Our social work group consisted of 14 people: a psychiatrist, a sociologist, a city manager, a commissioner of recreation, a woman concerned with the status of women, an educator, and others.

We paid them to meet with our architects and planners every 2 weeks for 6 months to discuss such questions as: What are the sources of loneliness and delinquency? Could the design of the city further achievement and fulfillment among the residents? How could a health system or an educational system work best?

We didn't want them to design a utopia—or design anything or even agree on anything. We just wanted to be better informed so we could design a city that would meet people's social as well as physical needs.

Did the social needs conflict with the environmental needs?

Rouse: The topography dictated that we concentrate development in some places and retain open space in others, such as in the stream valleys, but this met the social needs, too. We wanted a community based on fully developed neighborhoods and villages separated by open space.

Were the three lakes in Columbia built simply as a drawing card?

Rouse: Water for recreation and esthetics certainly attracts buyers, but the lakes are also very important sediment control points.

Young: About 2 years ago, Marshall Augustine¹ said there had been a dramatic reduction in the silt load coming to the main Patuxent River. He thought most of it was due to the sediment control specifications here in Columbia and in Howard County.

Rouse: Sediment control is not free. We've had to dredge two of the lakes twice, and we're going to have to do it some more.

Looking back on how you planned Columbia with conservation and the environment in mind, has it been worth the costs?

Rouse: The environmental quality of Columbia has been a very good investment and has more than paid back any cost incurred in it. Staying away from the stream valleys and respecting the grades has consolidated development where it was more economical.

The lakes have produced values that justify their cost. We've also spent a lot of money

¹ Former SCS soil conservationist and consultant to Maryland Water Resources Administration.

planting more than 350,000 trees and shrubs along the highways and public areas.

But you have to look at the economics of this development as a whole. You can't justify the cost of a lake, for example, in terms of what happens along its edges. You've got to judge it in terms of community-wide enjoyment and as a sediment trap. And you hope you are building a physical environment that will attract people for housing and businesses so you can market land at a profit.

In 1970, the Howard County Planning Commission did a study comparing the cost of developing the whole county to Columbia's standards versus the way the county had been developing before Columbia. What were the results of that study?

Rouse: The study showed that developing to Columbia's standards from 1970 to 1985 would save about \$200 million in sewer, water, and streets alone. It would save \$1 million a year in

maintaining streets because the concentrated development would mean shorter streets.

It would also save the state \$1 million a year in school transportation. In 1974 alone Columbia saved the state \$430,000 because the concentrated housing and facilities allow most of our kids to walk to school.

How did you first come in contact with the Howard Soil Conservation District?

Rouse: In 1963, we acquired this land farm by farm, and until we started construction in 1966, we were the largest farming operation in Maryland. Our farm manager made the first contact with the Howard SCD and with SCS, and he brought forth our early agreements with them.

Young: In 1966, Mr. Rouse signed an agreement as a district cooperator. We don't have one written conservation plan for all of Columbia. Instead, we have a specific plan for each area as we develop it.

Rouse chats with Jack Helm, SCS district conservationist for Howard County, Robert V. Young, and Bob Ziehm, district manager, Howard Soil Conservation District.



Statewide sediment control started in Howard County. How did that affect you?

Young: In May of 1970, a sediment control act was passed for the Patuxent River valley, which includes all of Columbia, and a year later the law became statewide. It requires us to submit sediment control plans for approval by the soil conservation district.

The Howard SCD was the first to have a district manager to get developers and builders to go along with sediment control. And the relationship between the Howard SCD and The Rouse Company was great.

It's the same now for storm water management. In the last year we've built rooftop storage and retention ponds even where they're not dictated by law because we think storm water management is good and someday we may be required to provide it.

We can't write down standard specifications and guidelines for everything. Lots of times I'll have to call the district conservationist. Without him and the Howard SCD, I don't know what we'd do.

In 1969, Hittman Associates² researched sediment control in Columbia for the Maryland Department of Water Resources, USDA, and The Rouse Company. What were the results?

Young: At that time we really didn't have any criteria to go by in controlling erosion and sedimentation—it was all guesswork. So the Hittman group monitored every bit of sediment that ran off Columbia's Village of Long Reach, which covers about 800 acres.

A lot of background information came from those tests. From that we developed criteria for standards and specifications for erosion control in urban areas.

Then we tried different ways to control erosion. We tried shavings, wood chips, excelsior, asphalt—anything we could put down. We would stake these areas out and measure the runoff.

Are you still testing conservation measures?

Young: Yes. As we start developing near a stream valley, for example, we pay an engineering agency to study how to control erosion

there. Incidentally, the vegetation we plant is recommended by the agency that does the study.

Once some people complained that the streambanks were eroding, so we showed them slides we had made before, during, and after development. One showed where the soil had been eaten out from under a stump, and the people said, "There! See what happens when you develop?" But that slide was made before we had done one bit of development! Before and after photos like those are valuable for all types of construction.

There are some changes in the stream valleys, of course, but they are minor—not to any disadvantage to the people or certainly not to the environment.

Do you follow up on conservation measures?

Young: Every year we walk the length of every stream valley with people from the Maryland Department of Water Resources. They recommend improvements for us to make.

Last year they made hardly any recommendations. We had constructed wiers in a stream to slow it down, and they commented that the water running off the wiers sounded like a rippling brook.

What is the cost of conservation measures in Columbia?

Young: In 1969, it was a third of 1 percent of each lot's value, and for the number of lots anticipated in developing Columbia, it represented an investment of hundreds of thousands of dollars.

The cost per lot has increased to half of 1 percent, but we are controlling erosion a little differently now. In 1969, we would put in a sediment basin, the district conservationist would approve it, and we would control the silt off an entire area. We were removing silt that had washed in from some builders' sites all the time.

Now we put in smaller stone filter dikes, and the builders must control the silt on their own sites. In other words, if a builder buys 10 lots, he has to keep the silt on those 10 lots. It's a little more expensive per lot.

Rouse: The average cost of a lot today is \$15,000, and half of 1 percent is about \$75.

² Engineering firm headquartered in Columbia, Maryland.

Do The Rouse Company and the people in Columbia agree on the virtues of your conservation planning?

Rouse: Our people and the people who live here never agree fully on anything. We have a lot of professional people—a lot of bright people—in Columbia. Hardly an issue can arise that there isn't some group of experts—and I really mean experts—in the field.

Last year, for example, a group of environmentalists criticized our land maintenance program in the Columbia Association, which maintains the public areas. This group proposed specific changes to make maintenance more sensitive to wildlife and nature.

We adopted their proposals, such as letting the grass grow higher, just when the recession caused a severe budget crunch in the Columbia Association. The new standards looked like an outrageous effort to save money, and they came in for a lot of criticism.

Young: The controversy quieted down in time, but some of it was amusing. One homeowner said, "Wildlife in Columbia is fantastic! I have a lot of snakes, groundhogs; . . ."

Did you try to preserve trees on house lots?

Young: At first we did. We made the builders save every tree possible, especially choice trees like white oak, red oak, and tulip-poplar. But later many of the mature trees died because some of the houses were too close to the trees. The homeowners were furious because they had to take the dead trees down. We ended up in a joint effort with the builders to remove the dead trees.

Now if a tree has to be welled or otherwise specially protected, we recommend that the builder go ahead and take it down. If a tree marked to be saved is near a foundation or where they're digging a footing, I go out and decide whether it should come down.

And we replant 10 trees to every one we take down.

Aside from snakes and groundhogs, did you have any provisions for wildlife in your original plans for Columbia?

Rouse: Al Geis, an ornithologist with the U.S. Fish and Wildlife Service at the Patuxent Wildlife Research Center, helped us out on that. At his request, we set aside 50 acres in the Middle Patuxent River valley for the breeding of the woodcock.

Young: Also, as construction moved along, Geis pointed out how minor flaws in construction or certain ornamental design features can attract undesirable birds, like starlings and pigeons. For instance, latticework was used to hide air conditioning equipment on some houses, but this attracts pigeons.

Rouse: From the earliest days of Columbia, systematic counts have been made to record the change in birdlife as the area changed from rural to urban. Now the establishment of the Urban Wildlife Research Center, a private organization in Howard County, has resulted in more extensive studies.

Is it possible for a private company to do the Columbia type of new town development now?

Rouse: I think it would be difficult. I think there should be—not a subsidy—but some sort of federal assistance to make large development possible, such as loans or grants to counties so they could hire the natural resource planners to do what we've done here. It's probably got to have enabling financing.

Under today's system without direct federal assistance, is there any way communities can start planning according to the land and do some of the things you've done here?

Rouse: Sure they could. A growing county could create a community development corporation, use the resources it has in sewer and water extension, and create a new community—easily.

Planning and zoning are looked upon as negative forces to constrain things rather than as initiating forces to make things happen. Planners want to deal with present problems. That problem-oriented focus is what limits our use of the planning power. I say, project what you want the region to be in 20 years and then guide your development to create it. ♦

Hitting the Conservation Trail

by John L. McLain and Wallace Peterson

Range conservationist, SCS, and
county extension agent, Cooperative Extension Service,
Minden, Nevada



On the conservation trail ride, Author McLain discusses native plants and their use for wildlife, watershed protection, and domestic grazing.

If you enjoy singing around a campfire at night and taking a weekend course on horseback, join—or make up—a conservation trail ride.

Last fall, 25 riders joined us for just such a ride into the Sierra Nevada Mountains. We carefully selected the trail for its beauty and plant life as well as for the environmental issues it presented, such as acid mine waste from the abandoned Leviathan Mine.

The first conservation trail ride in the area, it was sponsored by the Douglas County Extension Service, the Carson Valley Conservation District in Nevada, and the Alpine Resource Conservation District in California.

Specialists on the ride came from the University of Nevada, the Nevada Division of Forestry, USDA's Extension Service, Forest Service, and the Soil Conservation Service.

The trip, which would take us past the 8,000-foot mark to Leviathan Peak and then to Monitor Pass, started on a Saturday morning at the base of the mountains last fall.

We made many stops along the leisurely 6- to 7-mile ride that day, with the first one at the intersection of two creeks. One of the creeks flowed with clear water, while the other was brown with sulphuric acid from the Leviathan Mine. This mine had been worked extensively until 1962, and is now

in private hands and no longer mined.

The stop included testing the water and then led into a discussion of the effect of sulphur on wildlife and livestock.

As we climbed to Leviathan Peak, we stopped to watch Forester Dale Saunders, with the Nevada Division of Forestry, take core samples from trees and explain how the age of the trees is determined. Saunders also demonstrated instruments measuring tree height.

Most of the land we viewed was managed by the Forest Service, and Gary Sayer of the Forest Service discussed national forest lands. One purpose of trail rides like this one, he noted, is to raise the aware-



ness of the people who live close to national resources and may take them for granted.

That night, we camped at the Big Springs campground atop Monitor Pass. After a hearty steak dinner, we gathered around the fire. To an accordion accompaniment and three guitars, we got through a series of polkas and cowboy songs. We even made it well into the thirtieth verse of "Little Joe the Wrangler," a heroic tale of life in the old West.

The next morning, fortified with a breakfast of steak, eggs,

bacon, and pancakes, we watched a demonstration on the fine art of packing a mule. Doug Reynolds, a horse specialist with the University, also demonstrated how to make hobbles and feed bags out of gunny sacks.

On the way back, we demonstrated how to determine crop and plant yields by throwing a wire circle at random into the brush, clipping all the vegetation within the wire circle, and then multiplying the yield by using an established formula. We also studied plant species important to both wild-life and livestock.

Who went on our trip? Dal Byington, a Carson Valley rancher and chairman of the Carson Walker Resource Conservation and Development Council . . . Peggy Benson, a teacher and wife of a cattle rancher . . . John Hintze, a Gardnerville electrical supply dealer . . . Marianne Rosenlund, a Finnish exchange student.

The group was enthusiastic about the trail ride and we're planning another one for this fall with 65 riders to Bureau of Land Management lands. The slide show that developed from the trip has also been popular.

"It's an educational pro-



From far left, Doug Reynolds demonstrates how to pack animals for the trail ride. Author Peterson teaches the weekend students techniques for measuring woodland. Dallas Byington, a conservation district supervisor, demonstrates his talents for barbecuing steaks. Young riders find the going a challenge in heavily wooded areas.

gram," said Peggy Benson. "I think if you could get more people who aren't farm-related to understand the problems, it'd be better."

"I went with a very negative attitude when they told me I'd need a notebook and all that," said Don Hellwinkel of Gardnerville. "But it was interesting. They told me about plants I never realized existed. And it's good to see what the different branches of government are doing . . . We'd go again if we get the chance."

One of the "reluctant riders" was Tom Wixon, managing editor of The Record Courier in Minden.

He was soon enthusiastic and later featured two-and-a-half pages on the trip in his paper.

"Trail rides occur throughout the West each year, but few draw on the various agency specialists for assistance," he wrote.

"A conservation trail ride provides the public the opportunity to meet agency representatives on a personal basis, discuss conservation of natural resources, and the future of public lands. An outing of this type also gives resource specialists the opportunity to share their opinion with others and become better acquainted." ♦





Conservation Benefits at Blackwater

by **Don Schuhart and Shirley Foster Fields**

Information Division, SCS, Washington, D.C.

Above, Canada geese land in a field at Blackwater National Wildlife Refuge. At left, an SCS team at work at the refuge. SCS designed and supervised the installation of dikes and water control structures at the refuge. (Photos by Don Schuhart.)

When spring winds blow, the wild geese go. By the light of the moon and the morning sun, they take to the sky by the thousands. They know the day. They know the hour that is precisely right for the start of their great far north migration.

It's a long, long flight from Maryland's Eastern Shore to the birds' ancestral nesting grounds near James Bay, Ontario, Canada. From late September to mid-March, they enjoy winter rest and feeding at the Blackwater National Wildlife Refuge, near Cambridge, Maryland.

A few decades ago, Blackwater's Canada geese numbered no more than 5,000. Today, thanks to nearby modern farming and to the conservation management of Blackwater's rich, tidal marshlands, there are 100,000 wild geese during the peak November season.

Wildlife Conservation

A wildlife conservation plan begun 25 years ago by the U.S. Department of the Interior in cooperation with the Soil Conservation Service enhances the migratory birds' wetland habitat. SCS designed and super-

vised the installation of dikes and water control structures to keep brackish tidal water off adjoining croplands of corn, soybeans, and sorghum. In the fall, the birds feed on the crop residues, and in winter the same fields are flooded for wading and feeding on the tender shoots and roots of aquatic plants.

Similar conservation plans developed by Interior's Fish and Wildlife Service with SCS assistance are in effect at 171 wildlife refuges throughout the United States.

Snow Geese and Whistling Swans

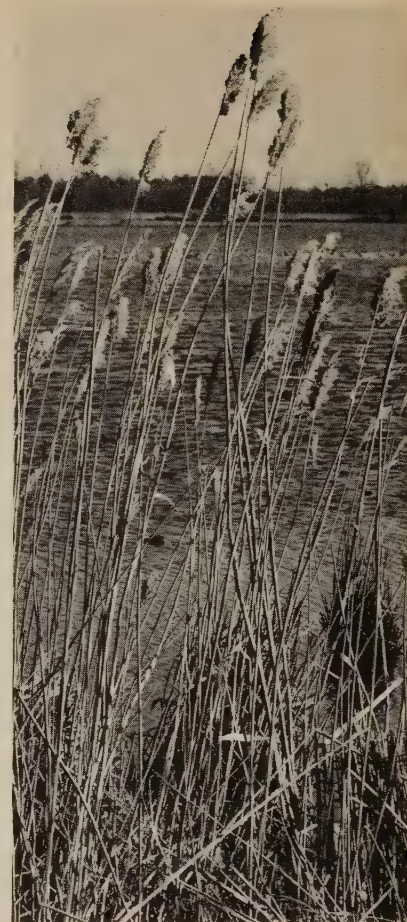
Wetlands are the best lands, not only for Canada geese, but for many other water birds. Snow geese and whistling swans, thousands of mallards, black ducks, and blue-winged teal also seek the Blackwater refuge for food and rest. The American bald eagle, still an endangered species, is safe

here, and so are the osprey, the egret, and the heron.

The Challenge

A tremendous challenge awaits goslings born of Canada geese this spring near the Arctic. Only a few months after their birth, they, too, will take to the skies with their parents. The older, stronger birds will lead them. They will take their direction from the stars, the sun, and the winds, and the great flocks will return to favored wintering grounds on the mainland of North America. ♦

An abundant food supply awaits migratory waterfowl at the refuge. In the winter, fields are flooded for wading and for feeding on aquatic plants.



Arkansas Wildlife Unlimited

by Susie Harris
SCS, Little Rock, Arkansas

Wildlife can expect extra opportunities in the "Land of Opportunity" this year, the result of "Arkansas Wildlife Unlimited."

The new project is geared to help cooperators with soil conservation districts in the state establish wildlife food plots on their land.

Sponsoring the project are the Arkansas Association of Conservation Districts and the Razorback Chapter of the Soil Conservation Society of America (SCSA).

"We hope that, as a result of this project, the cooperators will have a better appreciation for the role of wildlife on their

lands," said Dr. Roy A. Grizzell, Jr., SCS biologist in Little Rock.

Members of the Razorback Chapter of SCS helped package 300 sacks of seed to plant in quarter-acre food plots. The 10-pound packages were then made available through the conservation district to co-operators at \$5 each.

The sacks contained 2½ pounds of browntop millet, 3 pounds of red ripper cowpeas, 1 pound of sunflower, and 3½ pounds of annual lespedeza seeds.

The seeds will produce choice food plants for bob-white quail, dove, deer, wild

turkey, rabbit, and many species of song birds.

The seeds were selected not only for their high nutritional value, but also for the long time span in which they will provide food. Seeds produced from these plants resist decay after falling from the plant. "They will provide food right into the worst part of winter when most other foods are scarce," Dr. Grizzell said.

Each package contains information on the seeds and their wildlife benefits. SCS district conservationists in the state also provide assistance to the cooperators in selecting sites for wildlife plantings. ♦

"Arkansas Wildlife Unlimited" was launched last February in Dr. Grizzell's home, where he, his wife Virginia, and SCSA members—and retired SCSers—Aubrey Hough and Bill Johnson packaged 10-pound sacks of seed for wildlife plantings.



SCS Sponsors Workshop for Federal Women's Program Coordinators

by Anette M. Jenkins

Personnel Division, SCS, Washington, D.C.

"You have the right to be treated with dignity and respect. You have the right to say 'no.' You have the right to make mistakes."

That's the basis of assertiveness as taught last March to SCS's Federal Women's Program coordinators from 48 state offices and all four regional technical service centers at a 4-day workshop in Arlington, Virginia.

Assertiveness training teaches that you respect the rights of others as well as defending your own, and that you accept the responsibility that goes along with your rights.

Dr. Roland H. Tanck of George Washington University emphasized that assertiveness training does not make people obnoxious or bossy, does not destroy courtesy, and does not teach "one upsmanship." It does enable people to express their ideas and opinions, to make requests and refuse requests according to what is right for them, and to defend their own rights in a way that doesn't offend others.

Both George Washington University and the Trans-Century Corporation, a private management consultant firm in Washington, D.C., taught the course and made other presentations at the workshop as well.

Staff members from George Washington University's Continuing Education for Women Program lectured on motivating others and the kind of motivation that leads to success; value systems and how to set priorities; communicating effectively; and managing time efficiently—a real bonus to the coordinators, who perform their duties in the Federal Women's Program in addition to their regular SCS jobs.

Jinx Melia, vice president of Trans-Century Corporation, led that firm's presentation. She said barriers in the minds of some women keep them in low-paying jobs in business and government. These mental barriers are the need for male approval, fear of being called "unfeminine," acceptance of double standards, obeying authority without question, fear of taking risks, and a low concept of their own value.

Ms. Melia and other consultants from Trans-Century then discussed ways women can deal with these barriers to advancement, including how to listen to others objectively, how to make decisions, assertiveness, and how to raise other people's awareness of women's problems without conflict.

Other parts of the workshop were geared specifically to SCS. Top-level Washington and regional technical service center officials participated in a panel discussion on opportuni-

ties for women in SCS and in an evaluation and summary of the entire workshop.

SCS's Personnel Division representatives explained the Upward Mobility Program, which allows employees to move into positions of greater responsibility, and discussed classification and qualification standards, interviewing techniques, recruitment of women, the career development and promotion program, grievance appeals, and employee development.

R. M. Davis, SCS administrator, pledged his personal commitment to the Federal Women's Program. He spoke of challenges ahead in soil and water conservation that call for the best that both women and men have to offer the Service in terms of technical know-how, innovativeness, and ability to deal with and motivate people. Davis also suggested ways women and men can help each other find and merit higher careers.

The coordinators didn't just sit and listen throughout the workshop. Both on and off the program they discussed common problems and shared solutions. In fact, one coordinator said, "Although the outside speakers and the men added to the workshop, I learned the most from the other women."

The Federal Women's Program was established in 1967 to enhance the employment

Miss Jenkins is the Federal Women's Program coordinator for all of SCS.

and advancement of women. In 1969, it was integrated by Executive order into the overall Federal Equal Employment Opportunity Program.

Under the Federal Equal Employment Opportunity Program, agency heads are responsible for finding out what can be done to advance the status of women and minorities in their particular agency, for making specific plans for improvement, and for seeing that those plans are put into effect.

Each agency has a Federal Women's Program coordinator who acts as the agency's contact point, source of information, and adviser to the head of the agency on matters involving the employment of women.

In SCS, the state offices, regional technical service centers, the Washington office, and the Caribbean Area have Federal Women's Program coordinators as well.

These women are involved in all phases of the Federal

Women's Program, including recruiting qualified women; counseling women about careers; encouraging their offices to develop upward mobility jobs; and promoting continued education for employees.

SCS sponsored the March workshop to help coordinators better understand their role in the Equal Employment Opportunity Program and to help them learn skills to function more effectively. ♦

Gertrude Dunlap, Federal Women's Program coordinator in Pennsylvania, gets into a discussion at the SCS workshop in March.



Trout and Title X

by **Toy N. Campbell, Jr.**

District conservationist, SCS, Jefferson, North Carolina

One hundred years ago, fishermen in Ashe County, North Carolina, had little need for the paraphernalia of rod, reel, line, and lure. They could throw a rock and hit one, trout were so plentiful in these mountain streams.

Today, the few natural trout left share streams with old cars, rusting refrigerators, tires, plastic milk jugs, and garbage.

But the New River Soil and Water Conservation District

has started a program to reclaim Ashe County's streams for trout—and trout fishermen.

Six men, all dedicated fishermen, are spending their days improving the quality of the county's streams to insure a suitable habitat for the fish.

The trout stream improvement work, a project measure of the New River Valley RC&D area, is funded through Title X, the Job Opportunities Program authorized under the

Emergency Jobs and Unemployment Assistance Act of 1974. Money—in this case, \$75,000—is made available through SCS to conservation districts in areas of high unemployment. The districts hire the unemployed in conservation work.

In Ashe County, Ferris Crumpton of Creston is the supervisor of the trout stream improvement project. Crumpton decides what needs to be done with each stream—where to build aeration ponds, walk-throughs, and log or rock jet-ties.

Working with him are Joe Ashley of Warrensville, assistant supervisor; Scott Greer of Lansing; Ned Fowler of Chestnut Hill; Dillard Weaver of Grassy Creek; and Jeff Ray of Jefferson.

They are easily recognized by their blue coveralls, hip-length boots, white hard hats emblazoned with a decal of a rainbow trout, and by their shovels.



A log jetty is one method of stabilizing eroding streambanks.



The crew placed rocks in V-shaped formations to create small pools and water aeration—and better habitat for trout.

So far, they've improved streams for trout on about 27 miles of the 130 miles of public trout waters in Ashe County. They haul away trash—in a truck which also bears the trout decal, create riffle areas, and protect the streambanks from eroding.

One of the most important innovations the workers provide for sport fishermen and landowners resolves a major argument between the two—that fishermen climb over and tear down fences to reach trout streams.

The crew members put in cattle-impeding woven wire fences. Landowners give their permission and provide materials, and the crew members install, at intervals, a Y-shaped cattle proof walk-through.

They drive in posts and extend the wire fence to a walk-through. Cattle can't get through the narrow entry, and a little barbed wire across the bottom stops calves. Lean fishermen can walk through easily.

The crewmen painted the posts red so fishermen can easily spot the walk-throughs. Now, when a fisherman can't find a readily accessible way through to the streambank, he can walk a bit farther until he sees a painted post.

In some of the more out-of-the-way places in the county, trout may reproduce naturally, but most of the streams are stocked by the North Carolina Wildlife Resources Commission.

Money from fishing licenses and trout stamps goes to the state fish hatcheries for stock-

ing. When landowners permit streams on their land to be designated for open fishing, the state stocks the streams, usually with rainbow trout. Brown and brook trout are also stocked.

Fishing season in North Carolina is now 11 months out of the year. Only March is "closed."

Ashley, a forestry graduate of North Carolina State, is becoming an authority on trout since the project began last September.

"We pick our places for putting in rocks," he said, "and then we make a small 'V' across the creek, letting the swift water go through the point of the 'V.' We create a turbulence and, in effect, improve the oxygen supply for the trout. They need a great

James Houck, supervisor with the New River Soil and Water Conservation District, demonstrates a cattle-proof walk-through. The V-shaped passageways provide fishermen easy access to streams.



deal of oxygen to live. Dumping sewage effluent into a creek can supply too many nutrients and result in shortages of oxygen that can kill trout."

In one part of a stream, Crumpton points out soil erosion and siltation.

"This needs some type of

vegetative cover. Our job is to try to control the flooding, stop the washing away of good topsoil, and provide more pools and shelter for trout," Crumpton said.

On one bank, cut by floodwater, the crew stabilized it by wiring three logs to the

bank and filling in behind the logs with rocks. This channels the water away from the bank, prevents erosion, and creates a swift current on the opposite bank to form an eddy deep enough for trout to find shelter.

"It's filthy work—at least the cleanup part of it," Ashley commented. "And on fall and winter mornings, it gets mighty cold in these creeks. But it's good to do what we're doing."

"If this program had been started 20 years ago, we'd have more trout today," Greer said. "It takes a long time and we've got only 1 year to do it."

Ned Fowler, who studied drama at the North Carolina School of the Arts in Winston-Salem and who is now finding drama in reclaiming Ashe County's streams, said:

"The most important part of this project is to get the people of the county to realize that when they pollute their streams, they are killing trout besides making these mountain areas unlovely.

"Once it's clean, it has to be kept clean . . . and only Ashe County citizens can do that." ♦

The Trout Stream Improvement Project crew near one of their projects—Beaver Creek.



Achieving a Goal Of Water Supply

by **Harold D. Heise and Ronald W. Hayes**

District conservationist and project engineer, SCS, El Dorado, Kansas

A flood in a watershed is spectacular and grabs the headlines. But a drought can be equally damaging to a community from the standpoint of municipal, domestic, and livestock water supply.

In the mid-1950's, a severe and prolonged drought hit Butler County in south central Kansas. Stockmen hauled water for their livestock and the city of Leon brought water in by railroad tank car.

From that day on, farmers and ranchers became vigorous promoters of the watershed program in Butler County. Their major objectives: to increase the stream flow for livestock and provide a water supply in reservoirs.

Today, residents have achieved the goal of water supply development through watershed projects over much of this area in the Flint Hills.

The Butler County Conservation District has promoted and sponsored the seven watershed districts in the county. With technical assistance from SCS under the Watershed Protection and Flood Prevention Act, each district developed watershed land treatment programs.

The seven projects call for 120 floodwater retarding dams to be constructed in the county. These reservoirs in the upper tributaries of the various watersheds have permanent

pools of water that average about 30 surface acres and have an average depth of about 15 feet. They will strategically locate millions of gallons of unpolluted water in the county.

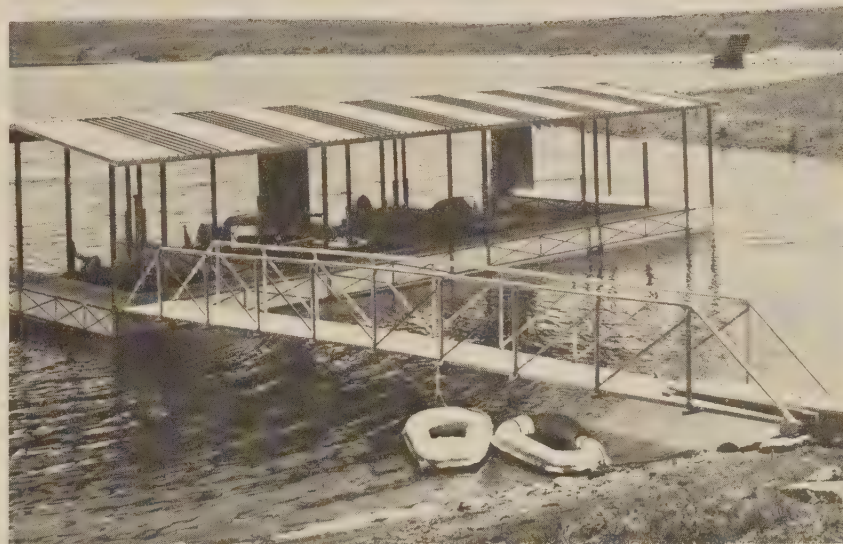
The Little Walnut-Hickory, Rock Creek, and Muddy Creek Watershed projects, with 64 reservoirs in the heart of the Flint Hills grassland area, have been completed. They have protected flood plain lands and properties from several intense rainstorms. In 1973, damage reduction in Rock Creek and Little Walnut-Hickory

watersheds amounted to \$383,300.

The projects also have provided multiple benefits to the communities. No longer do ranchers need to haul water to their livestock. Good water is available in flowing streams and clear reservoirs. During a drought in the late 1960's when Leon's water supply became critically low, valves were opened on upstream reservoirs of the Little Walnut-Hickory Project and water flowed to the city. The village of Latham in Rock Creek watershed has been able to abandon its wells and procure water from a floodwater retarding reservoir a short distance above that community.

Water for agricultural and domestic purposes, as well as wildlife and recreation, is having a stabilizing effect on the communities of Butler County. The environment has been improved and life is more pleasant for citizens of the area. ♦

A boat dock installation in the Little Walnut-Hickory Watershed is one of the recreational benefits of the watershed program in Butler County.



Conservation Districts Participate In Environmental Education Week

What happens during "Environmental Education Week"?

Last fall, two states—Oklahoma and Pennsylvania—had governors sign proclamations to promote conservation education.

During the proclaimed week, activities included television programs, mailing of teachers' kits, and participation by students.

In Pennsylvania, for instance, Mrs. Eleanor Bennett, environmental adviser of the State Department of Education, noted that the week was to create an awareness that would result in a continuing conservation education program. More than 500 orders for teachers' kits were received during the week. Most of the schools with outdoor education areas had special programs, and in the Harrisburg area, a special environmental education program for teachers and students was held at the state-owned William Penn Museum.

In Oklahoma, a television program in Oklahoma City focused on conservation education. Four panelists discussed the role of SCS and conservation districts in conservation education, the need for this type of education, how the university can prepare teachers to play a part in it, and how class-

room teachers can use the outdoor education concept.

Participants included a university professor, classroom teacher, conservation education specialist for the Pontotoc County Conservation District, and a representative from the State Department of Education.

At a school in Norman, Oklahoma, students displayed various activities that occur in outdoor classrooms. Sixth-grade students led a tour of the school grounds to show what they had done and planned to do to improve the grounds. The Cleveland County Conservation District sponsored the program. ♦

'Conservation Choices' Theme of SCSA Meeting

"Critical Conservation Choices: A Bicentennial Look" will be the theme of the 31st annual meeting of the Soil Conservation Society of America on August 1-4 in Minneapolis, Minnesota.

General sessions will cover land and water conservation through the nation's history as well as present methods of increasing food and fiber production.

Technical sessions will focus on specific challenges in using

the nation's land and water resources to meet these needs.

William Larson, a soil scientist with the Agricultural Research Service, St. Paul, is the program chairman for the meeting. F. Maynard Scilley, state soil scientist with the Soil Conservation Service in Minnesota, is in charge of local arrangements. ♦

New publications

Recommendations on Prime Lands. Prepared at the Seminar on the Retention of Prime Lands, July 16-17, 1975, sponsored by the USDA Committee on Land Use. 54 pp.

These recommendations are from the Seminar on the Retention of Prime Lands held last summer at Airlie House, Virginia. Eighty participants from across the nation gathered to consider the questions and issues raised by the continuing conversion of prime food, fiber, and timber producing lands to other uses. The seminar was sponsored by the USDA Committee on Land Use. The goal of the committee is to begin widespread public input and debate on the prime land issue. Reports developed by five work groups at the seminar are included, along with findings, conclusions, and recommendations. Single copies are available from the Information Division, Soil Conservation Service, Washington, D.C. 20250.

Soil surveys

Meetings

Kentucky

Ballard and McCracken Counties. By Maurice E. Humphrey. 1976. Soil Conservation Service in cooperation with the Kentucky Agricultural Experiment Station. 81 pp., illus.; maps.

Nebraska

Pawnee County. By Howard E. Sautter. 1976. Soil Conservation Service in cooperation with University of Nebraska Conservation and Survey Division. 74 pp., illus.; maps.

Pennsylvania

Venango County. By Norman J. Churchill. 1975. Soil Conservation Service in cooperation with the Pennsylvania State University, College of Agriculture, and the Pennsylvania Department of Environmental Resources, State Conservation Commission. 86 pp., illus.; maps.

South Carolina

Lexington County. By Carl B. Lawrence. 1976. Soil Conservation Service in cooperation with South Carolina Agricultural Experiment Station and South Carolina Land Resources Conservation Commission. 85 pp., illus.; maps.

June

- 1-3** "The Role of Phosphorus in Agriculture" Symposium, Muscle Shoals, Ala.
- 3-4** National Meeting of Keep America Beautiful, Inc., Dearborn, Mich.
- 6-10** American Society of Landscape Architects, San Diego, Calif.
- 7-9** American Plywood Association, Portland, Oreg.
- 13-18** Eighty-fifth Annual General Federation of Women's Clubs Convention, Philadelphia, Pa.
- 20-25** American Water Works Association Ninety-sixth Annual Conference, New Orleans, La.
- 21-23** Garden Club of America Sixty-third Annual Meeting, Minneapolis, Minn.
- 26-30** National Association of Counties, Salt Lake City, Utah

26-

- July 1** American Seed Trade Association, Inc., Convention, Los Angeles, Calif.
- 27-29** American Society of Farm Managers and Rural Appraisers Summer Meeting, Elizabethtown, Pa.
- 27-30** Sixty-ninth Annual Meeting of American Society of Agricultural Engineers, Lincoln, Nebr.
- 27-30** Twenty-third National Watershed Congress, Biloxi, Miss.
- 27-**

July 1

- July 1** Air Pollution Control Association Sixty-ninth Annual Conference & Exhibition, Portland, Oreg.
- 27-**
- July 1** Fortieth Annual Educational Conference of National Environmental Health Association, Nashville, Tenn.

July

- 10-14** American Association of Nurserymen, Inc., Boston, Mass.
- 11-15** American Society of Landscape Architects, San Diego, Calif.
- 14-17** Izaak Walton League, Baltimore, Md.
- 26-30** Symposium on Urban Flood Plain Management, Lexington, Ky.

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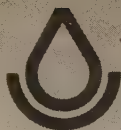
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From the
Administrator

Windbreaks: Fact and Fancy

Are windbreaks on the way out as a conservation practice in the Plains? This was the question raised at a recent symposium sponsored by the Great Plains Agricultural Council.

For the Plains as a whole, the answer is no.

But conservationists need to be sure of the answer in each county. More importantly, they need to be certain each acre is protected from wind erosion by some kind of conservation system whether it includes windbreaks or not.

Windbreaks or shelterbelts have met a variety of needs:

- Taking some of the sting out of drought conditions;
- Protecting crops including flowers and ornamental plants;
- Protecting livestock, helping them gain weight more consistently and hold their weight during blizzard conditions.
- Cutting fuel costs as much as 30 percent around the home in winter and helping cool the home in summer.
- Adding wildlife habitat and pleasant scenic patterns to the landscape.

Yet windbreaks aren't being planted fast enough; about as many in some places are coming down as are being planted. As I told the symposium, this is a bad year to be standing still in wind erosion control, in property protection, and in safeguarding crops and livestock.

Some windbreaks are coming down for good reason—they have become unsightly or ineffective (or both) because of disease, age, chemical sprays, or poor maintenance . . . or they sap too much moisture from crops. Some are being replaced with other, better windbreaks. Some are being replaced with other, better conservation practices in places where windbreaks didn't prove adaptable.

Other windbreaks are coming down for reasons the landowner thinks are good—to put more land into production . . . to install bigger irrigation systems . . . to enable him to use bigger farming equipment. He thinks high land values and good commodity prices will offset any impacts of windbreak removal.

We need to give these landowners accurate information quickly to make sure they understand the trade offs involved—economically and environmentally.

There are on-going programs of research, technical assistance, cost sharing, and public information; they need to be refocused and strengthened.

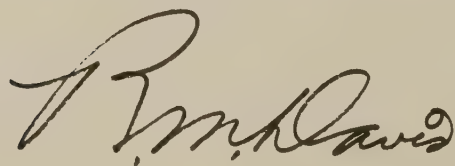
There are experienced leaders among district officials, private nurserymen and land improvement contractors in windbreak planting and renovation. They need to be encouraged to take an even stronger role.

Our goals need to be:

- All land protected from wind erosion through a system of conservation practices . . . there is no one panacea.
- All farmsteads with adequate protection from the wind.
- Windbreaks adequate to protect domestic animals.
- Windbreaks that give maximum benefit to birds and game.
- Windbreaks designed for maximum esthetic benefits.

We can help trees and shrubs make their maximum positive contribution to the environment and economy of the Plains—by aiding landowners with windbreaks that suit their needs.

I hope to see more windbreaks as I travel through the Plains during the months and years ahead. They may be different from those planted 100 years ago or 40 years ago, but they need be no less effective.



Soil Conservation

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Earl L. Butz
Secretary of Agriculture

R. M. Davis, Administrator
Soil Conservation Service

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Contents

- 2 From the Administrator
- 4 "Living Textbook" Opens in Pennsylvania
Frederick Bubb and Clarence Wilson
- 6 Harvesting a Hobby
Morris S. Gillespie
- 7 Narrow Rows Reduce Runoff on Sorghum Fields
- 8 Coon Creek: Marker in the Pages of Soil Conservation
- 10 The Eads Bunch
Diana Morse
- 14 Watch on Water Witches
- 15 Mapping Florida in an ATV
Leon T. 'Skip' Stem, Douglas L. Lewis, and Howard Yamataki
- 16 Continuing Conservation on the Pocatello Benches
Gale V. Roberts
- 18 Doughnuts for Ducks
Allen Vaughn
- 19 50,000th GPCP Contract Signed in Oklahoma
F. Dwain Phillips
- 20 Pick Shin: on the Bicentennial Tour
Frank Jeter, Jr.
- 21 Need for a New Approach Stressed
at Great Plains Windbreak Symposium
John M. Cross
- 23 Meetings

COVER: John Lesh, one of "The Eads Bunch," maps soils in eastern Colorado. (See story on page 12.)

"Living Textbook" Opens in Pennsylvania

by Frederick Bubb Information officer, SCS, Harrisburg, Pennsylvania
and Clarence Wilson Area conservationist, SCS, Raleigh, North Carolina

"The Living Textbook" has pages that are often 80 feet tall and 100 years old, and always in living color. It's the name students have given the McKeever Environmental Learning Center near Mercer in western Pennsylvania.



Streams are among the study resources at McKeever.

The center covers 205 acres of native woodland, complete with a trout stream that flows through a stand of tall hemlocks. Its physical plant consists of a discovery center that has three indoor and two open-air classrooms, a dining hall for 120 people, three lodges that accommodate 120 overnight guests, and an auditorium that seats 200.

The McKeever Environmental Learning Center is owned by the Commonwealth of Pennsylvania. It is directed by a board of commissioners that represents Clarion, Edinboro, California, Indiana, and Slippery Rock State Colleges, the Sandy Lake Conservancy, the State Department of Education, and the State Department of Environmental Resources.

Dick Touvell directs the center, assisted by a teacher, a naturalist, an environmental educator, student teachers, and community volunteers.

The center opened last September and, by the end of December, 2,200 persons had come to study there for a few hours to a week. About 15 percent were college students and 40 percent were adults.

Adult groups have included educators, public officials, scout leaders, and conservationists. They come to the center from New York, Ohio, and West Virginia, as well as Pennsylvania.

"Our purpose is not to teach tree and bird identification," Touvell explained. "It is to teach environmental values and attitudes to teachers and students. For example, several weeks ago Clarion State College had a course here for its education students on methods of teaching social studies. This is the type of group that can help us achieve our goal. Working with adult leaders allows us to increase our impact."

Touvell noted that during one month the center's visitors



One of the three lodges at McKeever Environmental Learning Center

included engineering students from Westminster College who studied "social responsibilities of engineers," the faculty of Edinboro State College's English department who explored nature and literature, and the USDA Forest Service, which conducted its environmental education workshop for adults there.

The center encourages programs of several days. Some of the most satisfying learning experiences occur in the evenings when groups gather around a roaring fire in the lodge to discuss the day's happenings. The informal setting encourages more discussion, said Touvell.

The idea for the center began in 1964 with Ivan McKeever, then SCS state conservationist for Pennsylvania, and six local residents, all members of the Sandy Lake Conservancy. The group located a site for the center and then began working

to make the idea a reality. Several local residents even signed a note for the loan to purchase the property until the state legislature appropriated funds for the center.

The physical plant, started in 1971, was built at a cost of \$1.3 million. Cooperating colleges provided desks, chairs, beds, and other equipment for the center.

When the Penn Soil Resource Conservation and Development (RC&D) executive committee began operations in the area, the McKeever Center became one of its main efforts. Through the RC&D program, multi-county support was obtained for the center.

At first, operating funds for the center were a problem. As Touvell said, "For a time I was the only employee. I was janitor, cook, dishwasher, teacher, and administrator. If it weren't for local residents who volun-

teered their help, I never would have made it.

"You have to give the local people credit. They really wanted this center, and they wanted it to succeed."

Because of the cooperation of the state and local people, RC&D, and regional colleges, "The Living Textbook" has made a successful start. As its brochure claims, it is a place where not only the fifth grader but also the research scientist can find inspiration, solitude, and a near-perfect environment. ♦

Mr. Wilson was formerly coordinator for the Penn Soil Resource Conservation and Development area, Clarion, Pennsylvania.



Harvesting a Hobby

by Morris S. Gillespie

Information officer, SCS, Auburn, Alabama

What started out as a hobby has resulted in more than 1 million pine seedlings being planted by Alabama's Rush Smith—and most of them by hand.

Smith took up timber stand improvement as a hobby more than 40 years ago, and he's been a cooperator and supervisor with the St. Clair County Soil and Water Conservation District (SWCD) almost ever since.

Today, his tree farming operation has expanded to 11 farms on 1,700 acres. And the first seedlings he planted are beginning to return a profit.

"Planting trees is a long-term investment," he said. "I first got interested in tree farming after buying 52 acres of woodland right after I was married 22 years ago."

He bought the land with a loan from the Farmers Home Administration and recalls how difficult it was to make payments. The land cost about \$50 an acre then; today, such land is selling for \$700 an acre, Dr. Smith said.

He's removed all the fencing on his land and put in trees except where he maintains a pasture for his children's horse. His farms are in three counties and within a 15-mile radius of his home in Ashville, 40 miles northeast of Birmingham.

He's a cooperator with the three soil and water conserva-

tion districts in which he farms: Bounty County, Etowah County, and St. Clair County. He has been a supervisor of the St. Clair SWCD since 1958, and has conservation plans on all his farms.

Dr. Smith has arranged his schedule as a chiropractor so that he can look after his farms and participate in community projects. His wife teaches business administration at a nearby vocational school. They have three children—a 14-year-old daughter and two sons, ages 17 and 20.

Smith has been a representative for St. Clair County on the Coosa Valley Resource Conservation and Development Council for several years and was elected chairman last July.

He's been instrumental in getting many projects completed for the improvement of the county. One is the Ashville Flood Prevention Measure No. 1 that has controlled flooding and provided drainage for mosquito control.

"Before the Ashville project was completed," said Ashville Mayor Joe Atkins, "it took about a week for the floodwater to flow down following floods. Now it runs off in about 24 hours. Residents could not



Rush Smith

enjoy themselves outside their homes at night due to mosquitos from the swamp; mosquitos are no problem now."

For his tree farming operation, Dr. Smith has purchased loblolly pine seedlings from the State Forestry Commission nurseries. He has planted all but 200 acres by hand.

"There is very little expense after the trees are planted," he said. "Before planting, we kill the scrub hardwood trees."

He began harvesting on his "long-term investment" last year. He is thinning some of the first plantings of trees, cutting about a third of the stems. This yields about \$70 an acre—10 cords at \$7 a cord for pulpwood. The purchaser bears the cost of harvesting operations.

"We used to do our own harvesting and sell in Rome, Georgia, but due to the labor situation, we now sell all trees on the stump," Dr. Smith said. He plans to thin again in about 7 years and then the remainder will be ready for sawtimber in 10 more years.

Smith's interest in conservation extends far beyond woodland management. He's built a lake, four ponds, has one more under construction, and is planning two more. In addition to recreation, the ponds offer water for fire protection for his trees.

"All were built to meet SCS specifications," he said. "During a flood about 10 years ago, many pond dams in St. Clair County were washed out, but none constructed to SCS standards was lost. All my ponds held up well."

The lakes are a center for many activities in the community. All are stocked with bass and bluegill and one is stocked with channel catfish. A local church uses the lake on top of Chandler Mountain for baptismal services. Families living near use it for swimming.

Dr. Smith also is interested in wildlife management.

"I have four quarter-acre plots of bicolor lespedeza for quail and leave all good hardwood trees in the hollows," he said. "We have plenty of food and cover for deer and wild turkeys in the area."

Dr. Smith has planted fescue, a good grass for erosion control around the pond dams. He also has planted sericea lespedeza, bicolor lespedeza, tick clover, and other plants for food and cover for wildlife.

Now, his 20-year-old son is interested in a career in soil and water conservation. And, much as his father got started, he's planting pine seedlings and starting timber stand improvement on nearby land his father recently gave him. ♦

Narrow Rows Reduce Runoff on Sorghum Fields

Narrow row spacing of dryland grain sorghum conserves water, cuts soil erosion significantly by reducing runoff, and increases crop yields, according to a study by USDA's Agricultural Research Service (ARS).

Spacing sorghum rows 27 to 30 inches apart provides an earlier and more complete leaf canopy than the conventional 40-inch rows. This leaf canopy intercepts more sunlight, breaks the force of falling raindrops, increases water intake by the

soil, and reduces evaporation.

Measurements taken throughout the growing season showed little difference in soil water content between narrow and conventional row spacing. This suggests that sorghum planted in closer rows uses water more efficiently than sorghum planted in conventional rows.

The central Texas study showed that narrow row spacing increased yields of dryland grain sorghum by 15 to 20 percent over conventional spac-

ing. It increased the value of the yield by \$30 per acre. Narrow row spacing was done with conventional farming equipment and did not increase production costs.

The study was conducted by soil scientists John E. Adams, Joe T. Ritchie, and Earl Burnett, ARS; agricultural engineer Clarence W. Richardson, ARS; and agricultural engineer Gerald F. Arkin, Texas Agricultural Experiment Station at Temple. ♦

Coon Creek:

Marker in the Pages of Soil Conservation

A study underway in one of the nation's historic soil conservation areas indicates that stream sediment loads may not be reliable indicators of upland erosion.

The study is by Dr. Stanley W. Trimble, an assistant professor of geography at the University of California at Los Angeles.

The study area is in the Coon Creek watershed which, in 1934, became the first Soil Erosion Control Demonstration Area of the U.S. Department of Agriculture. Coon Creek is a tributary to the Mississippi River in the Driftless Area of Wisconsin.

Trimble brought 400 people up to date on his long-range research project recently at the Third Federal Inter-Agency Sedimentation Conference in Denver, Colorado, March 22-25.

The conference was sponsored by the sedimentation committee of the Water Resources Council. John Holman, SCS geologist in Washington, D.C., was chairman of the conference. The first conference was held in 1947 and the second in 1963.

Trimble's paper was one of 46 presented in Denver. Sym-

posium topics included sediment yield and sources, erosion and sediment control, physical and chemical properties of sediment, channel adjustments, and coastal zone sedimentation.

Trimble's study noted "the extraordinarily high rates of erosion and sedimentation which can exist under human disturbance, and conversely . . . that these high rates can be greatly mitigated."

Within the last few years, there has been little deposition of sediment in the valley, and the present rate may be less than 10 percent of the high rates of the 1920's and 1930's, Trimble noted.

"This decrease is primarily attributed to changes of land use and land treatment," he said. An important aspect of land treatment was the application of conservation measures on cultivated land.

Trimble found in his study of the watershed that, since the 1930's, the tributary channels have continued to erode, indi-

cating that stream sediment loads may be partially attributable to channel rather than upland erosion.

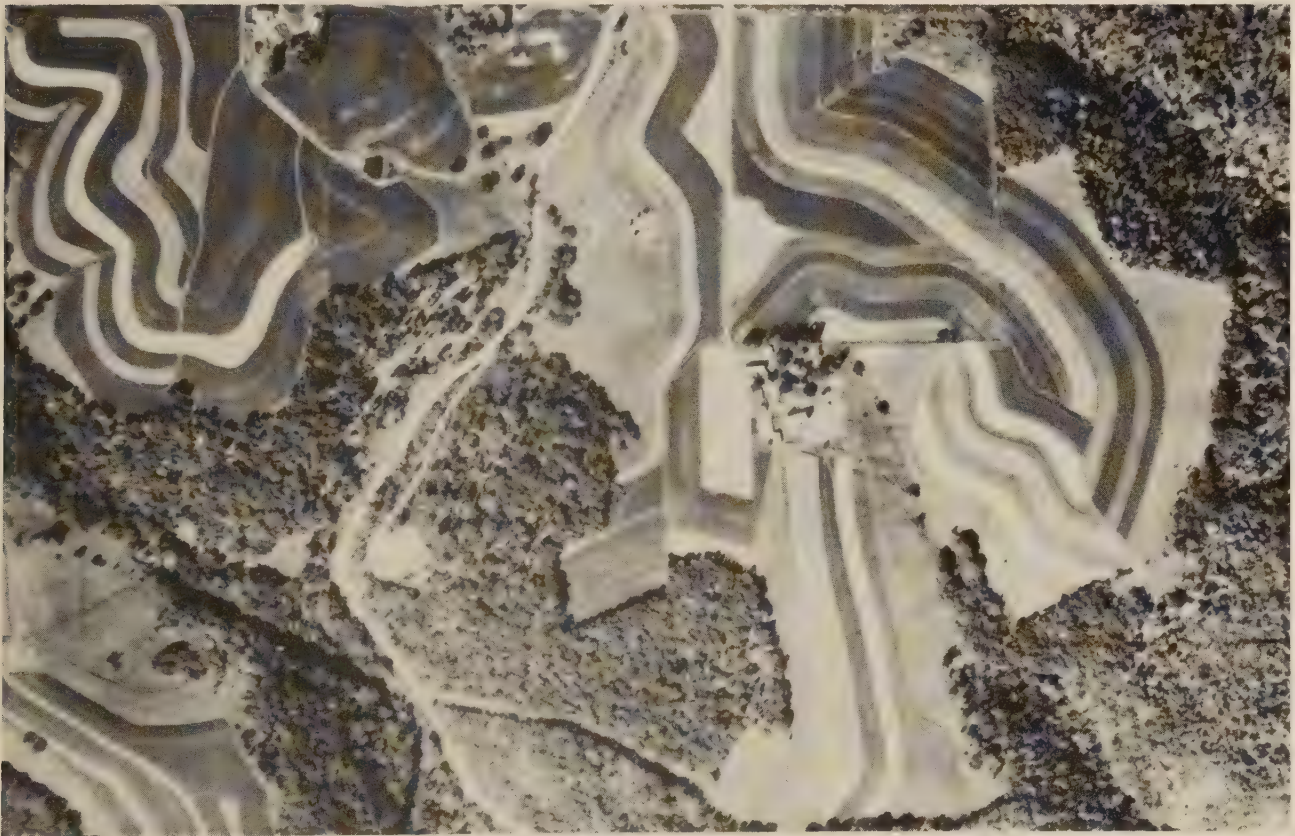
Thus, he said, stream sediment loads may be dubious indicators of upland erosion rates even when sampled for more than a third of a century.

The area was selected for study because the effects of man's destructive, as well as constructive, activities were readily apparent. Also the area had been intensively studied in the 1930's and detailed baseline data were available. SCS has provided assistance in Trimble's study.

The Coon Creek watershed has been the subject of study for many, including Hugh Hammond Bennett, first chief of the Soil Conservation Service and Vincent E. McKelvey, present director of the U.S. Geological Survey. In 1938, Dr. S. C. Happ designed a comprehensive long-range study for the SCS of the sedimentation phenomena there. Although never completed as planned, the study showed the general magnitude and distribution of modern sediment and its relation to stream channel erosion, Trimble said.

Trimble's study, undertaken in 1974, is to (1) determine changes of stream and valley morphology since the 1938 study by resurveying as many old valley cross sections as can be recovered; (2) determine past and present rates of sediment storage and movement in streams and valleys; and (3) find how the morphology and sedimentation changes relate to changes of watershed land use and land treatment.

Copies of the Proceedings of the Third Federal Inter-Agency Sedimentation Conference are available from the National Technical Information Service, 5285 Port Royal Road, Springfield, Virginia 22161. Price is \$23.75. ♦



In early 1934, Coon Valley was marked with rectangular fields and gully systems extending into the upland cultivated fields. The same area, in 1967, exhibits contoured and strip-cropped fields. Not visible are many other soil and water conservation practices, such as crop rotations, stubble mulching, and crop residue management.

by Diana Morse
Information Division,
SCS, Washington, D.C.

The Eads Bunch

They called themselves "The Eads Bunch," and in less than 3 months, they mapped the soils on more than half a million acres in the Great Plains. They assembled last January in the small town of Eads, Colorado, and proceeded to survey half of Kiowa County.



Stan Albee (not in photo)
Dave Alstatt
Dave Anderson
Paul Deutsch
Bev Foley
Bill Hawn
John Lesh
Don Murray
Mike Petersen
Darrell Schroeder
Katie Thorsheim
Les Williams

The U.S. Government has been mapping soils for more than 75 years, but this survey was unusual. In most, SCS soil scientists work singly or in pairs. For the special assignment in Kiowa County, however, 11 soil scientists—a third of Colorado's soil scientists—were sent to Eads in this sparsely settled county of 2,000 people.

The group was young, with a median age of 27. Four were relatively new to soil surveying,

having mapped for less than a year. Yet these professionals, most graduates of Colorado State University, mapped at a rapid rate, averaging more than 1,800 acres per person per day.

They were led by the youngest SCS soil survey leader in the state, Dave Anderson.

"This has been a new experience for nearly everyone involved," said Tommie Holder, SCS's state soil scientist in Colorado.

Holder, a Texan, started the



Don Wickman, who joined the group late in March, with Don Murray.



Bev Foley in the office at Eads.

Kiowa County effort to speed up mapping in Colorado. Most of the soil scientists came from the western slope of the Rockies, where winter weather nearly eliminates outdoor work for soil scientists.

"There were two main benefits from this operation," Holder said. "First was production. We mapped 600,000 acres in 3 months in an area where we set a priority. We wouldn't have been able to do that without this special assignment.

"Second was the training opportunity."

Anderson, the 27-year-old leader and organizer of the group, agreed. He moved to Eads last August with his family to make arrangements for the "invasion." He lined up a mechanic for the 12 pickup trucks to be used in the operation, arranged office space, developed work assignments and training plans, set quality and quantity goals.

"He had to have a plan that

could change from morning to afternoon," Holder said.

Anderson set the pace . . . and "The Eads Bunch" exceeded it.

One reason, said 25-year-old Katie Thorsheim, was the opportunity to talk with—and argue with—fellow soil scientists.

"Here, if we weren't sure of an exact soil series name, we'd gather a sample during the day and bring it back to the office to talk about.

"It's easy for a soil scientist to get very jealous of his map. It's like a work of art. You've done every part of it yourself and you don't want someone criticizing it.

"But when we'd get a chance to talk over questions every day as they arose and draw on the many years of experience here, we could map a little faster."

Two mornings a week, the group gathered in Anderson's office to discuss the areas they were mapping, raise questions,

give and receive on-the-job training.

Then, each headed out to the field in his or her own dark green SCS pickup truck with a power probe on the back. To get around in planted fields, they had two motorcycles to drive between rows and avoid damage to crops.

The team, from 55-year-old Les Williams to 23-year-old John Lesh, spent their days alone in the field, mapping with augers and with the power probe. They missed only a few days because of inclement weather.

Ahead of and behind them was a strong support staff. Gale Garner "ran" ahead of them getting permission from farmers and ranchers for the soil scientists to map their soils.

"I made one telephone call and got turned down, and I never made another," said the 26-year-old native of Kiowa County. He set a pace for himself of personal contacts and



kept ahead of the "augerers and probers."

Bev Foley, another temporary employee, sent letters to all county landowners who lived elsewhere. She also did some lab work and indoor map work.

At the SCS area office in La Junta, Don Moss, Anderson's supervisor, provided administrative support—from keeping time-and-attendance records to getting supplies into Eads as quickly as possible. Eads, with a population of 1,000, is about 160 miles east of Denver.

One of the reasons behind the accelerated soil survey was the interest by Kiowa County officials to get it done. Last year, they authorized \$10,000 to speed the survey on 100,000 acres. They were interested in information on the suitability of soils for cropland and rangeland and on the location of flood plains.

"Most people can remember they had a flood in 1941 or 1942," Anderson said. "But the soils and vegetation give tangible indications of past flooding."

The best land in the county is Class III, which is suitable for continuous cultivation. Most of the land in the county is Class IV, suitable for limited cultivation, or Class VI, which is generally not suitable for cultivation.

"It's odd that people will farm their poorest soil," Anderson said. "Many put grass on their best soils and plant their crops on their worst, on their Class VI land."

The survey is already being used to provide such information to landowners. Not 20 feet away from where the soil survey crew files its information is the desk of Bob Hawn, SCS district conservationist in Eads. He has leaned over backwards to help the soil scientists and was



At left, Dave Anderson, who heads the soil survey operation at Eads, works with John Lesh in the field. Above, Katie Thorsheim checks soils.

the first to use their work. He began providing information on soils to county residents as soon as it arrived.

In total, Hawn can look at maps covering 605,980 acres. The group also wrote 153 soil descriptions.

"It's probably one of the best documented surveys in terms of field notes and soil descriptions and samples," Holder said. "Dave knew they couldn't be there later."

Hawn's twin brother Bill was one of "The Eads Bunch" and temporarily named one of the best soils in the county "rant and rave."

That name held until the SCS soil correlator came from Denver to study it and give it an "official" name.

Hawn's "rant and rave" soil runs in a 3-mile-wide belt from the western end of the county and swings south. It's the best farmland in the county; hence

Hawn's naming it because "the farmers rant and rave about it."

The soil scientists found that it was productive because just the right amount of sand had been blown in and covered heavier loess soil, acting as a mulch and retaining moisture in this area of low rainfall.

Although the group varied widely in age and experience in soils mapping, they all had in common the new experience of the special assignment in Eads. It was a different life for most.

Katie Thorsheim had driven in from Golden near Denver with her pickup truck and sewing machine. She managed to make a down vest while she was there.

Most stayed in one of the two motels in town. Some brought their wives. John Lesh brought his dog Gooshner.

"The one thing that got depressing was the wind," Lesh said. "You couldn't see far

ahead of you. Some reported they had gotten lost. You had to find a fence and follow it."

"In the western Plains," Anderson said, "you could walk 20 miles and not come to a house. And you could go 300 miles if you weren't checking a map and knew where to go."

The soil scientists, alone with their pickup trucks and their mapping, saw herds of pronghorn antelope and lots of coyote. They saw golden eagles, prairie dogs, and rattlesnakes. And in the western end of the county where there are reservoirs, they saw snow geese and ducks.

"It certainly ended better than it started," Anderson commented.

He recalled the start of the special assignment in November. Two 6-week assignments were planned, one to start in November and the other in January. But the soil scientists had been in the field less than

half a day last November, after driving from the western half of the state, when one of the worst blizzards to hit the area began.

"We were snowed in for a week, drifts were so bad we couldn't map, and I sent them home until January," Anderson said.

The January detail, of course, was a successful one, and "The Eads Bunch" received a special commendation from the agency.

They're gone now, leaving only Dave Anderson, John Lesh, and Don Murray to map in a three-county area. Many will be back this year, however, to continue mapping Kiowa County.

The target date to complete field work is June 1977, allowing for such weather stoppers as last year's blizzard. ♦

Watch on Water Witches

Editor's Note: A brief reference to a Nebraska "water witcher" in "Calculating Conservation" (April 1976 SOIL CONSERVATION) has drawn several protests from engineers and geologists. In the interest of fair play, we are providing more than equal space to "anti-witch" comments contained in a letter from Paul H. Lehr, executive director of the National Water Well Association in Worthington, Ohio:

"The water well industry in America today supplies more than 110 million people with their daily drinking water. Ground water resources are now estimated to have a volume 30 times greater than that of our nation's surface water.

"The level of sophistication of our industry has grown as rotary well drilling machines have risen in cost to \$150,000, and as complex analog-digital and electrical modelling techniques have been developed by such institutions as the U.S. Geological Survey to scientifically determine the nature and extent of our potential underground water resources.

"It is thus disturbing to read an article in such a fine magazine as SOIL CONSERVATION which

still alludes to the location of underground water through the antiquated and unscientific technique of a 'water witcher' . . .

"Intensive scientific testing has long ago shown water witching to have no valid application whatsoever, and that its success is based on the natural elements of chance and luck alone. It is to no one's benefit to promote the continuation of a dark age, renaissance, Americana folklore in a scientific age where we have begun to conquer outer space . . .

"I would hope in the future that you would attempt to edit your fine magazine more closely. In turn, as editor of the journal of Ground Water (the world's leading research journal in ground water science) and as editor of the Water Well Journal (the leading industrial trade journal) I promise not to print any stories promoting a belief in the magical seeds of Jack and the Bean Stalk." ♦

Mapping Florida in an ATV

by Leon T. 'Skip' Stem,
Douglas L. Lewis,
and Howard Yamataki

Soil scientists, SCS,
Jacksonville, Florida



SCS soil scientists Howard Yamataki and David A. Howell map in the "little green ATV."

Conditions under which a soil scientist works are not always the best, even in the Sunshine State.

Needlegrass that can puncture skin and eyes . . . loose sand that can bog down vehicles . . . swampy areas that bog down vehicles and soil scientists.

That's why an all-terrain vehicle (ATV) has been so popular with the SCS soil scientists mapping in Duval County in northeastern Florida.

Its use is one of the reasons that the soil survey can be completed a year ahead of schedule.

Built for use in marshes, the ATV has 14-inch wide tracks made of flexible, one-piece molded rubber for maximum traction and minimum ground pressure.

In needlegrass and other thick and thorny flora, the ATV knocks down a path and provides a dry platform for soil investigations.

This is especially important in Duval County, which has 50,000 acres of tidal marsh at the mouth of the St. Johns River and along the Intercoastal Waterway.

The soils in the tidal marsh have a very low bearing strength. The little green ATV is invaluable here, because it puts less than a pound of pressure per square inch on the ground even with the weight of two soil scientists, their equipment, and the vehicle.

On loose sand, such as beach dunes, the traction of the ATV lets soil scientists easily take slopes with grades up to 15 percent.

In the water, the top speed of the ATV is 2 miles per hour, and on land, 15 miles per hour.

Most of Duval County is flat and wet. The soil survey party has used the ATV in many other areas inaccessible to standard four-wheel drive vehicles, including wet pastureland and formerly mined areas that are now sand dunes.

The last hole will be bored for the Duval County soil survey this year, and all those mapping in the county will remember with fondness the "little green ATV." ♦



by Gale V. Roberts
District conservationist, SCS, Pocatello, Idaho

Continuing Conservation on the Pocatello Benches

Pocatello, second largest city in Idaho, has set new erosion and sediment control standards to preserve nearby prime agricultural land by guiding urban expansion on the bench terraces that overlook the city.



This photo, taken in April 1937, shows the contour furrows on the benches overlooking Pocatello. The furrows were put in with a team and plow and finished by Civilian Conservation Corps hand labor. They look much the same today.

water tanks on the benches and turned to the Portneuf Soil and Water Conservation District (SWCD) for help in avoiding erosion, sedimentation, and flooding.

The district helped develop the Pocatello Bench Sediment and Erosion Control Guide. The district asked the Soil Conservation Service to prepare a soil survey and used this and other technical information to prepare the guide, published on April 15, 1975. It contains definitions, recommendations, standards, and specifications for controlling erosion. It also includes engineering data for constructing runoff-retarding structures, such as sediment basins.

The city planning commission, city planning department, elected officials, contractors, and engineers are using the guide in planning and installing conservation measures.

Because each development is different, one combination of erosion and sediment control practices may work for one development but not for another. For this reason, the Portneuf SWCD board reviews the plans for each subdivision plot in Pocatello to make sure the conservation measures will be adequate for the particular design and location.

"This review process has proven successful," said Jerry Mason, planning director for the city. "It should insure protection for the bench area in years to come."

Concern for conservation on the Pocatello benches developed through experience. In the early 1900's, ranchers

moved their livestock across the benches between winter grazing areas at a lower elevation and higher summer grazing areas. Townspeople grazed their horses on the benches year round.

The original vegetation was destroyed, and deep-rooted grasses were replaced by shallow-rooted annuals and bare ground. Because the vegetation was too sparse to hold the soil in place or to slow runoff water, the benches periodically subjected Pocatello to dust storms and disastrous floods.

Then, in the 1930's, residents and city officials requested the federal government to establish a Civilian Conservation Corps (CCC) camp in the area, and a flood control project was launched under the direction of the Soil Conservation Service.

By 1939, 850 miles of water-holding contour furrows spaced 20 to 50 feet apart had been constructed on the benches. Many were dug by hand or with horsedrawn plows. Grazing on the benches was stopped, and almost 10,000 acres were reseeded with deep-rooted grasses.

During periods of heavy rain, water was trapped in the furrows and gradually seeped into the soil or evaporated. The furrows, which are still visible, have protected the city from flooding for more than 35 years.

Although many of the furrows will be destroyed by development, city officials hope the conservation measures outlined in the guide and approved by the Portneuf SWCD Board will continue to protect Pocatello. ♦

City officials knew that Pocatello could either expand onto the agriculturally rich Tyhee Flats or onto the benches east and west of the city. The benches could provide housing for an estimated 55,000 people, but they are highly erodible and water running off the benches could flood Pocatello.

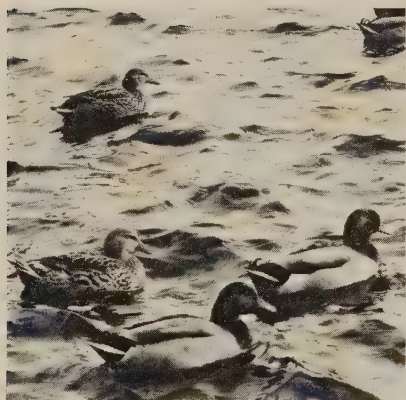
In 1973, the officials decided to encourage development on the benches, away from the Tyhee Flats. They built several

Doughnuts for Ducks

by Allen Vaughn
Biologist, SCS, St. Paul, Minnesota

Doughnut-shaped stockwater dugouts may look strange to humans from the air, but they look inviting to waterfowl.

These popular ponds in the Northern Plains add diversity to the landscape.



Most of the dugouts are constructed as simple and inexpensive stockwater ponds in areas too flat to make embankment ponds feasible. Many of them are designed by the Soil Conservation Service and with cost sharing from the Agricultural Stabilization and Conservation Service.

The ponds average 6,000 square feet and are not more than 5 feet deep to accommodate shallow-feeding ducks and to encourage vegetation for food and cover. They usually are dug where there is a high water table to keep them full.

The dugouts are especially popular in the flyway areas in the western and central parts of Minnesota.

The ponds can be square, rectangular, circular, or any one of a number of other shapes, but the circular design with an island is one of the most popular. The islands are attractive loafing areas for ducks.

Some dugouts are constructed specifically for wildlife—usually waterfowl. The design then is modified to have more gradual slopes. This permits more shallow water for the growth of aquatic plants that supply food and cover for waterfowl.

Dugouts also attract other water-oriented birds, songbirds, mink, muskrat, raccoon, and deer. ♦



Verle Brady (center), his son Randy, and SCS District Conservationist Jerry Allen work on the plan that became the nation's 50,000th contract under the Great Plains Conservation Program.

50,000th GPCP Contract Signed in Oklahoma

by F. Dwain Phillips
Information officer, SCS, Stillwater, Oklahoma

When the 50,000th contract under the Great Plains Conservation Program (GPCP) was signed, it was appropriate that it was in Oklahoma.

This program has played an important role in conservation in that state for 19 years.

To mark the occasion, a ceremony was held in Freedom, Oklahoma, on March 27 to honor the 50,000th signers, Mr. and Mrs. Verle Brady, who own a 1,840-acre farm in western Oklahoma, not far from Freedom.

Edward E. Thomas, assistant administrator of the Soil Conservation Service, presented a commemorative plaque to the

couple at the ceremony attended by more than 300 people.

"My biggest concern is to turn marginal cropland back to grass," said Brady, who grew up in the Dust Bowl.

The Bradys' plan includes planting more than 50 acres of cropland to grass, constructing 2,000 linear feet of diversion terraces, and instituting management practices. The land to be planted to grass is poorly suited to cultivation, Brady

said, and the change will reduce erosion and eliminate the uneconomical part of the farm operation.

The Bradys plan to complete this work in 3 years. Plans under the Great Plains Conservation Program can take up to 10 years to complete.

Under the Great Plains Conservation Program, the Secretary of Agriculture has contracted with the Bradys to share the cost of needed soil and water conservation measures. In addition, the Bradys will receive special help in planning and applying the conservation work from the Soil Conservation Service's technical staff serving the Woods County Conservation District.

The purpose of the Great Plains Conservation Program (Public Law 1021) is to assist farmers and ranchers in carrying out, on a voluntary basis, plans to bring greater stability to their operating units. The plans spell out cropping and grazing systems to be followed and soil and water conservation practices to be applied.

Public Law 91-118 extended the program to the year 1981 and added provisions for enhancing fish and wildlife habitat and recreation resources, promoting the economic uses of land, and reducing agriculture-related pollution.

Oklahoma leads the nation in the number of active Great Plains Conservation Program contracts, with more than 2,600 as of December 31, 1975. Since the beginning of the program, 6,637 contracts have been written, covering 4,896,363 acres in the 30 western counties of the state. ♦

Pick Shin: on the Bicentennial Tour

by Frank Jeter, Jr.

Information officer
SCS, Raleigh, North Carolina

As part of the Bicentennial celebration, an outdoor classroom in North Carolina is drawing on the past for its buildings and furnishings.

Students and adults in hilly Surry County, northwest of Winston-Salem, are recreating farm scenes of yesterday at the Pick Shin Nature Center near the little town of Dobson.

Along the nature trail, they've put the small wooden Possum Trot Schoolhouse, an authentic 19th century schoolhouse. It was acquired by a neighbor in the community and transported to the nature center, where students completed the restoration.

Inside the schoolhouse is a pot-bellied iron stove. On chilly days it is fired up so students can hold classes there.

A genuine one-room country store, about 15 feet square, stands nearby. The goods for barter are provided by the students.

Another point of pride is a small log house (don't call it a cabin in these parts) first built and occupied in 1875 and recently moved to the nature center as part of a cooperative effort. Many of the furnishings, from the old water bucket to tea cups, are authentic.

Of course, some new building was necessary. Students

built the two comfort stations, which are old-style outhouses with only a few modern conveniences added.

The center is included on the Bicentennial tour of the Piedmont area of North Carolina. To prepare for visitors, students are working hard to restore antique farm equipment and other symbols of the lifestyles of yesterday to pristine condition. They also are planning to add a museum of horse-drawn farm equipment to the center.

The Pick Shin Nature Center is more than a historic museum. It was originally planned as an outdoor classroom and environmental laboratory.

In 1973, the Surry County schools received a \$10,000 grant for an outdoor classroom from the State Department of Administration. Work on the Pick Shin Nature Center began the following year with technical assistance from the Soil Conservation Service.

A total of 75 acres on the campuses of Surry Central High School and Surry Community College was set aside. So far, 30 acres have been developed as a nature center, and the

other 45 acres are used for wildlife habitat.

Donald Vestal, vocational agriculture teacher at the high school, soon became involved in the project. Although students at all grade levels helped, Vestal's vo-ag classes spearheaded the work on the classroom.

Fred Patterson, SCS district conservationist for Surry County, provided the conservation information used as a basis for the entire nature area.

Community enthusiasm for the nature center and Bicentennial project was high almost from the inception. Ruritan Clubs in Surry, Wilkes, Yadkin, and Stokes Counties helped find antique farm equipment and home furnishings.

"In the near future, visitors will be able to see us churning real butter in old farm churns," said Charles Fletcher, supervisor of Surry County schools.

Conservation is a keynote of the Pick Shin Nature Center. Ed Brewer, SCS soil scientist in the Wilkesboro area office, worked with students to expose for study a natural soil profile in a slope along the trail. Conservation practices are demonstrated in several places around the nature center.

The center is used for subjects ranging from agriculture to creative writing and by all the local schools, from first grade to the community college level. In addition, people from neighboring counties come to take advantage of its unique learning opportunities. In the 1974-75 school year, some 7,300 students used the outdoor classroom.

The facilities are available 7 days a week, 12 months a year. The Pick Shin Nature Center is a favorite place at all seasons of the year. ♦

by John M. Cross

Head, Information Unit, Midwest Technical Service Center,
SCS, Lincoln, Nebraska

Need for a New Approach Stressed at Great Plains Windbreak Symposium

What can be done to halt the removal of tree windbreaks
on the Great Plains? Why are they being removed?

These and other questions are bothering conservationists
in the 10 Great Plains states and elsewhere.

More than 120 conservationists, researchers, foresters, conservation district officials, and administrators met in a windbreak symposium in Denver, Colorado, April 20-22 to explore the situation. The meeting was sponsored by the Great Plains Agricultural Council, headquartered at Lincoln, Nebraska.

The problem was brought into focus by a 1975 report to Congress by the Comptroller General of the United States. The report followed a study

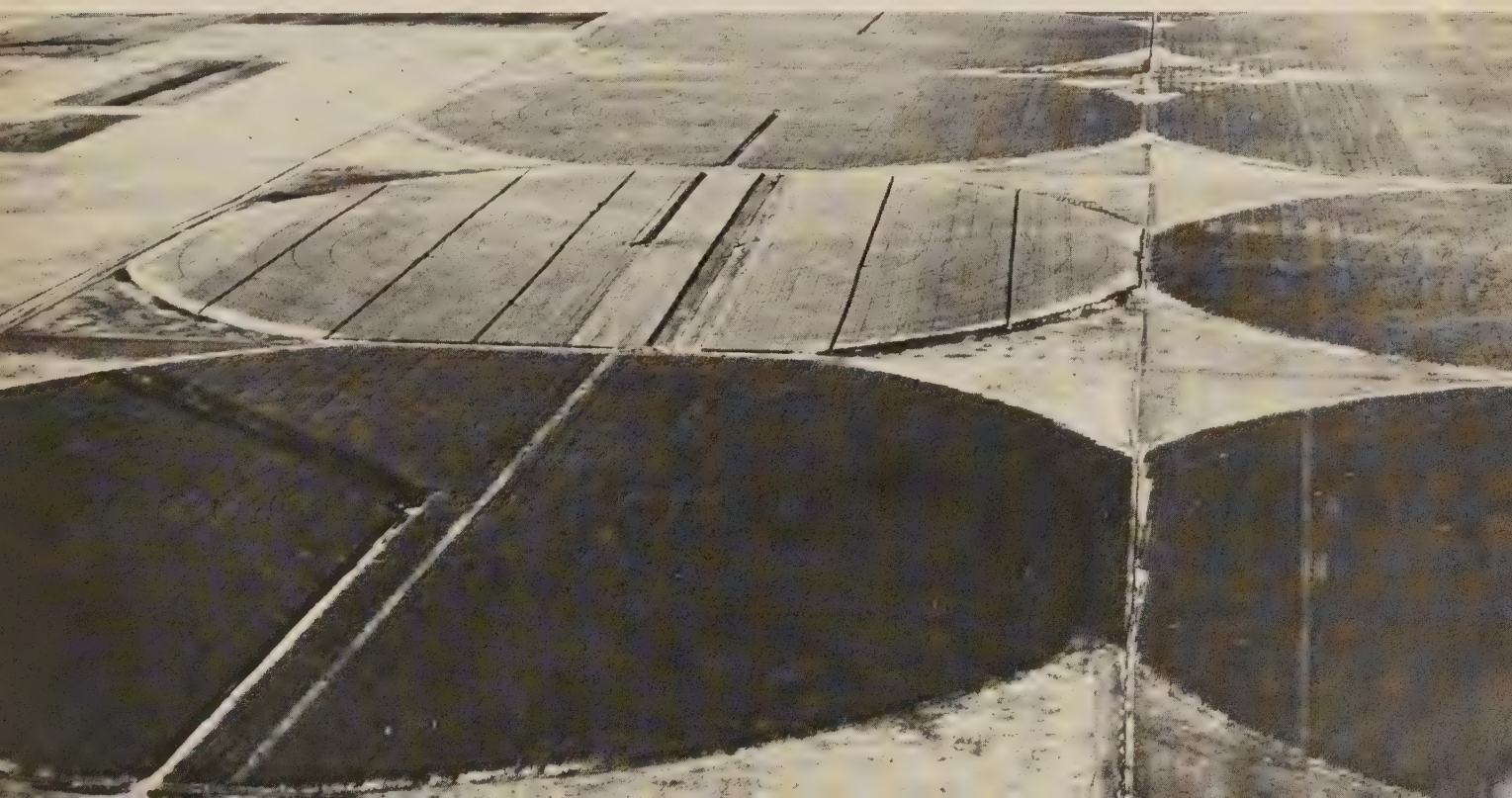
made by the General Accounting Office (GAO).

"In the past 100 years, millions of trees have been planted on the Great Plains," the report stated. "In recent years some windbreaks, particularly those planted in the 1930's and early 1940's, have been removed. This has caused concern that continued removals will lead to increased soil erosion."

Supervisory auditor Larry Goldsmith of GAO, in his address to the symposium, said: "Unless action is taken to en-

courage farmers to renovate and preserve the existing windbreaks rather than remove them, an important resource which has taken many years to develop could be lost." Goldsmith participated in the original study.

Representatives of the Soil Conservation Service, Agricultural Research Service, and Forest Service, all in USDA, and of state land grant universities and state forestry agencies presented papers at the symposium. Lyle Bauer, a national



"... this is a bad year to be standing still in wind erosion control, in property protection and in safeguarding crops and livestock."

—R. M. Davis

spokesman for conservation districts and member of the USDA Public Advisory Committee on Soil and Water Conservation, and several other district representatives appeared on the program.

They reviewed recent progress in windbreak planting as well as pointing out needs for the future.

"As yet there is no crisis in windbreak removal but in some places almost as many are coming down as are going up," said SCS Administrator R. M. Davis in presenting an overview of the situation. "And this is a bad year to be standing still in wind erosion control, in property protection, and in safeguarding crops and livestock."

He pointed to the drought conditions on the Plains and the reports of accelerated damage from wind erosion.

Clearing tracks for center-pivot irrigation systems is one of the reasons for windbreak removal, according to the GAO report.

"We removed some trees for a center-pivot system," said Bryce Nedig, a farmer of Madison, Nebraska, but he admitted it was a somewhat less than ideal situation.

"We should once again be tree planters rather than windbreak removers," he said.

GAO compiled information in 16 counties in Oklahoma, Kansas, and Nebraska. Highest rate of removal was in Seward County, Nebraska, where 13.3 percent of existing windbreaks have been removed in the last 5 years.

SCS District Conservationist Bob Chilvers of Neligh, Nebraska, told the group there

were 459 miles of windbreaks planted in Antelope County before 1950, and 503 miles planted since then. Since the first center-pivot irrigation system was installed in 1955, 35 percent of the later single-row windbreaks have been removed. Farmers are cutting half-moon notches in some of the older multiple-row windbreaks in order to let circular sprinklers pass through.

Some 27 miles of the older plantings have been removed entirely at a cost of \$300 to \$350 per acre to the farmer. The four-county northeast Nebraska area has 2,600 center-pivot irrigation systems.

Chilvers outlined modified planting patterns being used in the Upper Elkhorn Natural Resource District. Triangular windbreaks on the northwest and northeast corners of the fields under irrigation help stop wind and snow and provide 6-acre plots for livestock protection, wildlife habitat, hay, or extra grazing.

Arc-shaped rows of trees on the southwest and southeast corners of the circle break the south winds. Some farmers are planting the entire 6-acre plots to Christmas trees.

"We need new varieties of plants that will grow no taller than 8½ feet even with extra water and fertilizer. Then we can put single-row windbreaks across the circle and the system will pass over it," he said.

Trials with red cedar kept trimmed to 8½ feet have offered temporary help but the trees grow fast and will soon have to be removed. Several varieties of roses are being observed.

But there are other reasons why windbreaks are being removed.

"NACD did a quickie survey when we first heard of the GAO report," said NACD Vice President Bauer. "We found that more windbreaks were being removed because of age, changes in farming, diseases, and insects than in capricious efforts to gain more land for farming," he added. They also found more trees being planted than being removed.

The symposium speakers said the push for more land was not an important factor in removal. The small acreage gained hardly pays the cost of removal, they commented. But they did agree that the age, disease, insect, and irrigation problems are real. They concluded that more research is needed on these questions.

"Technical support for the windbreak program has suffered in recent years," said Bauer. "Nearly all research has been phased down or phased out."

"Incentives are far more effective than regulation as a means of resource management," Bauer said.

He said that America's conservation districts would support programs of information, research, land treatment, financing, and organization to reverse the trend in windbreak removal.

The philosophy that windbreaks alone do not make a complete conservation program was agreed to at the symposium. Chilvers said that windbreaks team up with conservation tillage to keep maximum amounts of litter on the land, and with emergency practices to keep down wind erosion.

SCS Administrator R. M. Davis said that many of the annual erosion control measures are dependent upon

weather and that tree windbreaks are there on the job every year.

Other speakers discussed the use of annual crops and wind barriers. Many referred to shrub plantings that serve a variety of uses. Several reviews pointed to new varieties and new nursery techniques available.

"There is a need for a new approach resulting from fresh concerns coming out of the GAO report," said Dr. Ken Gilles, vice president of North Dakota State University and chairman of the Great Plains Agricultural Council, in summarizing the meeting.

He charged the symposium committee and the forestry committee with responsibility for bringing full reports and recommendations to the Great Plains Agricultural Council's executive committee, which meets in Big Sky, Montana July 27-28. Suggested actions then will be forwarded to the membership for implementation.

Three urgent needs surfaced at the symposium: (1) an effective information and education program to urge landowners to reevaluate windbreaks; (2) new research into windbreak renovation and more adapted species for the changes in farming; and (3) accelerated technical and financial assistance to implement these programs. ♦

Meetings:

June

1-3

"The Role of Phosphorus in Agriculture" Symposium, Muscle Shoals, Ala.

3-4

National Meeting of Keep America Beautiful, Inc., Dearborn, Mich.

6-10

American Society of Landscape Architects, San Diego, Calif.

7-9

American Plywood Association, Portland, Oreg.

13-18

Eighty-fifth Annual General Federation of Women's Clubs Convention, Philadelphia, Pa.

20-25

American Water Works Association Ninety-sixth Annual Conference, New Orleans, La.

21-23

Garden Club of America Sixty-third Annual Meeting, Minneapolis, Minn.

26-30

National Association of Counties, Salt Lake City, Utah

26-

July 1

American Seed Trade Association, Inc., Convention, Los Angeles, Calif.

27-29

American Society of Farm Managers and Rural Appraisers Summer Meeting, Elizabethtown, Pa.

27-30

Sixty-ninth Annual Meeting of American Society of Agricultural Engineers, Lincoln, Nebr.

27-30

Twenty-third National Watershed Congress, Biloxi, Miss.

27-

July 1

Air Pollution Control Association Sixty-ninth Annual Conference & Exhibition, Portland, Oreg.

27-

July 1

Fortieth Annual Educational Conference of National Environmental Health Association, Nashville, Tenn.

July

10-14

American Association of Nurserymen, Inc., Boston, Mass.

11-15

American Society of Landscape Architects, San Diego, Calif.

14-17

Izaak Walton League, Baltimore, Md.

26-30

Symposium on Urban Flood Plain Management, Lexington, Ky.

August

1-4

Soil Conservation Society of America, Minneapolis, Minn.

10-12

Symposium on Inland Waterways for Navigation, Flood Control, and Water Diversions, Fort Collins, Colo.

15-18

American Agricultural Economics Association, University Park, Pa.

15-18

National Farm and Power Equipment Dealers Association, St. Louis, Mo.

15-19

National Association County Agricultural Agents, Richmond, Va.



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Mainstay of Agriculture ... and Conservation

From the
Administrator

"I am happy to report," said Secretary of Agriculture Earl L. Butz in a recent editorial, "that family farming in the United States is holding its own as the most permanent and dominant influence in American agriculture."

He reported that about 95 percent of all U.S. farms are still family farms and produce about 60 percent of all farm products sold. As for incorporated farms, the Secretary noted that more than 90 percent of these are closely held family corporations, rather than large agribusiness firms.

"Family farms," he concluded, "continue to be a mainstay of American agriculture."

The ability of the family farm to survive is good news for conservation, because the family farmer is also the mainstay of soil and water conservation.

In the early days of SCS, it was family farmers who offered their farms as demonstration sites for soil conservation practices.

It was family farmers who organized the first conservation districts. Today family farmers and ranchers still make up 71 percent of the conservation district supervisors in the United States.

It is family farmers who have developed and supported soil stewardship observances in their local churches.

Almost always, it is a family farmer—frequently encouraged by his sons and daughters—who tries out a new agricultural practice. In county after county, it is the family farmer who is the first to put in parallel terraces with tile outlet drainage; who first experiments with no-till farming and invites his neighbors over for a look.

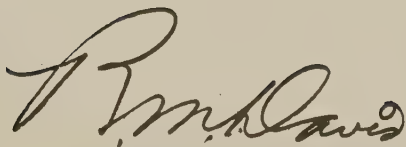
It is the family farmer or rancher who decides to install conservation measures on his land—even when he isn't convinced that he will get his investment back in higher net profits next year. That is because a family farm is more than a factory for producing income; it is also a home; a source of personal pride; a legacy for one's children.

As we mark the 200th anniversary of our country's birth in freedom this month, we should remember that it was the yeoman farmer, the family farmer, who "fired the shot heard around the world" and eventually won our independence.

In the years that followed, it was the family farmer who loaded his wagon and moved west to settle a nation.

Now it is the family farmer—and rancher—who keeps alive our voluntary program of soil and water conservation . . . who conserves and improves our basic resources .

The Soil Conservation Service salutes farm families in this Bicentennial Year and prays that they will continue to be the mainstay of American agriculture and of conservation for the next 200 years.



Soil Conservation is the official magazine of the Soil Conservation Service. The Secretary of Agriculture has determined that publication of this periodical is necessary in transaction of public business required by law of this Department. Use of funds for printing *Soil Conservation* has been approved by the Director of the Office of Management and Budget through July 31, 1978.

Earl L. Butz
Secretary of Agriculture

R. M. Davis, Administrator
Soil Conservation Service

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Cover:
Contour strips provide erosion control
on a dairy farm in the Northern
Panhandle Soil Conservation District
in West Virginia.

Contents

- 2 From the Administrator
- 4 Spotlight on a Youth Conservation Commission
Anne Zack
- 6 A Real Bargain
- 7 CBers Band Together on Flood Warning Network
Lowell Edminster and Frederick Bubb
- 8 Land Judging Contest Draws 1,000 Competitors
F. Dwain Phillips
- 10 "You Can't Lose"
- 10 Arboretum Project Blossoms into Award
- 11 A Rookie Looks at Soil Erosion
Ewing Jones
- 15 National Soil Erosion Conference
Honors Walter H. Wischmeier
- 16 Your Soils' Potential
- 16 Pilot Study Concentrates on Soil "Potentials"
William Kercher and Fred Merrill
- 18 Dam of Plenty
LaVerne S. Anderson
- 20 Wyoming Ranchers Coordinate Conservation
on Public and Private Lands
Dann A. Fosher and R. Steven Scheldt
- 22 Assembly Line for Seedlings
Boyd A. Ruth
- 23 Lake Liberty
- 23 Meetings

Spotlight on

by Anne Zack

a Youth Conservation Commission

Puppets are among the spokesmen "employed" by seven high school students spreading the conservation message in South Carolina.

They're just a sample of the work done by the Lee County District Youth Conservation Commission, said Ronnie Feaster, SCS district conservationist for Lee County, east of Columbia.

The students developed a puppet show especially for the Goodyear Awards judges when they visited the county last spring. Now they present it to local schools and clubs.

The youth commissioners wrote the script, made most of the puppets, built the stages, and painted the backdrops.

"We just give them an idea," Feaster said. "They use their imagination and come up with

something fresh every time. And they do it all themselves."

The Lee County Soil and Water Conservation District Board organized the youth conservation commission in July 1975 to help young people understand the importance of conserving natural resources. A district committee selected the commissioners from students recommended by county high school principals and counselors.

The district has sent the youth commissioners to study resource conservation at a 1-week summer workshop at Clemson University. The workshop, sponsored by the South

Carolina Association of Conservation Districts and the South Carolina Land Resources Conservation Commission, gives young people classroom and field experience in practical conservation. The district board plans to send all future youth commissioners to the workshop as well.

At their organizational meeting last summer, the youth commissioners outlined their plans for the coming year. Their goal was to inform county residents of conservation district programs and conservation in general. In less than a year, they began turning out all sorts of finished projects.



"Their programs are so good," said Feaster, "that most clubs ask them to come back again."

A favorite one is writing and taping conservation messages for radio station WAGS in Bishopville, the county seat. Each month the youth commissioners produce six or seven spot announcements or one longer program geared to the season or to current developments in conservation.

The youth commissioners also write a short feature for the local newspaper each month.

"Many civic and garden clubs in the community have invited the youth commissioners to present conservation programs," said Wiley Alexander, vice chairman of the group. "Sometimes we just give talks. Other times we put on a play, the puppet show, or a slide show. For one program, we even wrote a poem."

Although most of the slide shows the youth commissioners use are ordered from SCS, they did put together one of their own. To mark the Bicentennial, the youth commissioners

gathered slides and wrote a script about the history of farming and conservation in Lee County.

"Their programs are so good," said Feaster, "that most clubs ask them to come back again."

The task of writing the monthly articles and radio spots is passed from person to person. Writing for special projects, such as the puppet show and club programs, is a group effort.

"We think seven is a good number for a youth board," commissioner Cindy McDowell said. "There are enough of us to get things done. We meet on the third Thursday of each month, and between meetings at least three or four of us can always get together at each other's house to work on projects."

The youth commissioners work with all the schools in the county on conservation programs and outdoor classrooms. At one school, they

helped elementary teachers with an Arbor Day program, planting a maple tree and setting up a bird feeder and a bluebird box.

They also helped fifth and sixth graders plant a pine windbreak alongside the school and explained to the students how grass and windbreaks help control erosion.

The youth commissioners have stirred up so much interest in conservation through their activities in the schools that there is a waiting list of students who want to serve on the commission.

"They do other things, too," said Frank Lake, SCS soil conservationist and adviser to the youth commissioners. "They help the district with essay and speaking contests and with Environmental Stewardship Month. They help with just about all the district's activities."

District Conservationist Feaster believes that the possibilities for using a youth board are limitless. "Although we still carry out our own information program in the district office,"



Wade Atkinson, Wiley Alexander, and Cindy McDowell lend technical support as Debbie Davis tapes a conservation message at radio station WAGS.



The youth commissioners set up a bird feeder on Arbor Day.

he said, "they can do a lot of things we don't have time to do. And they get new ideas for helping us out all the time."

As the youth commissioners get new ideas, they fit them into their annual plan and go to work. One of their latest ideas is to use a cassette recorder to tape interviews with farmers, equipment dealers, and others in the county on how conservation affects them.

They plan to use the recordings in their radio programs.

The district board liked that particular idea so much that it agreed to purchase a recorder for the project.

Feaster said such interviews would do more than supply material for the radio programs. He thinks the youth commissioners will spot areas of interest, or problems that the district may have overlooked. They can

bring these to the district's attention.

And last May, the youth commissioners were featured guests on a talk show, "Carolina Today," produced at station WIS in Columbia.

What did they talk about?
"Conservation!" ♦

Ms. Zack is a writer with the Information Division, SCS, Washington, D.C.

A Real Bargain

This "ad" appeared in North Carolina newspapers 20 years ago to "sell" conservation to local farmers. SCSer Ray Bryant, now district conservationist in Bakersville, North Carolina, worked on it with conservation district officials. "I remember visiting a farmer for the first time shortly after it came out," he recalls. "He had it framed and on his wall. We got to talking about it, and he not only became a district supervisor, but one of the most aggressive conservationists I've known."

For Sale

One Avery County Farm

TOP HALF WASHED TO GULF OF MEXICO—
MINERALS GONE WITH TOP SOIL

All Fields Suitable To Wash.

- 37 Gullies, 1 foot to 4 feet deep (due to grow larger)
- 1 Empty House, doors and windows missing, lean-to 2 rooms and a path.
- 1 Leaning Barn, to be moved on account of lack of storage for manure.
- 2 Stacks of Mixed Grasses, Mostly Broomsedge.
- 3 Stacks of Briars and Assorted Weeds.
- 4 Mineral Deficient Cows. They are gentle, used to getting poor in the winter. Guaranteed to have rickets and no calves.
1-quarter mile of fence with plenty of baling wire for repairs.
- 1 Sow and 2 Pigs; would eat anything.
- 17 Chickens, used to roosting in trees, rooster too weak to crow.
- 43 Acres of Overcut Timber, been burned recently—no known Wild Game.

Other articles too worthless to mention.

Reason for Selling: Owner going to work for a CONSERVATION FARMER who has taken care of his soil.

Will your farm ever be in the same condition as the one described above? Would you like to do something to stop this destructive waste of our most precious natural resource . . . our soil

Join Hands With Your
AVERY COUNTY SOIL CONSERVATION DISTRICT
CONSERVATION DOES NOT COST . . . IT PAYS!

CBers Band Together on Flood Warning Network

by Lowell Edminster
and Frederick Bubb

CBers in Monroe County, Pennsylvania, are "tuned in" to a flood warning network.

The Citizens Band radio is a vital link in the flood warning system in this rural community in the heart of the Pocono Mountains. More than 20 volunteer CBers, all members of the Monroe County Civil Defense, report on upstream water levels during emergencies.

"Volunteer fire companies keep the civil defense headquarters informed of water

levels in the various towns in the county through a VHF-low band public service radio network," said Joel Keller, director of the county civil defense. "The CB operators supplement this with information from farther upstream so we can warn towns of predicted flood levels.

"This is a small county, but we have to be prepared to handle a lot of people during

emergencies because we're a popular vacation area," said Keller. "We rely on volunteers."

About 20 years ago, 78 people drowned in the county on the lower Brodhead Creek as a result of flooding from Hurricane Diane.

The Soil Conservation Service determined that flood damages did not justify a PL-566 floodwater retarding structure and suggested residents develop a flood warning system as an alternative.

Such a system was developed in 1972 after flooding from Hurricane Agnes convinced residents that something had to be done.

Since that time, the CB operators have assisted civil defense during six flood emergencies, including one that was locally more damaging than Hurricane Agnes.

"It's hard to put a dollar figure on the value of an early warning system," said Ace Raymond, assistant operations director for the county civil defense. "It allows people and property to be evacuated.

"But we are proud of the fact that not one life has been lost since the flood warning system was established." ♦

Mr. Edminster is SCS district conservationist in Stroudsburg, Pennsylvania.

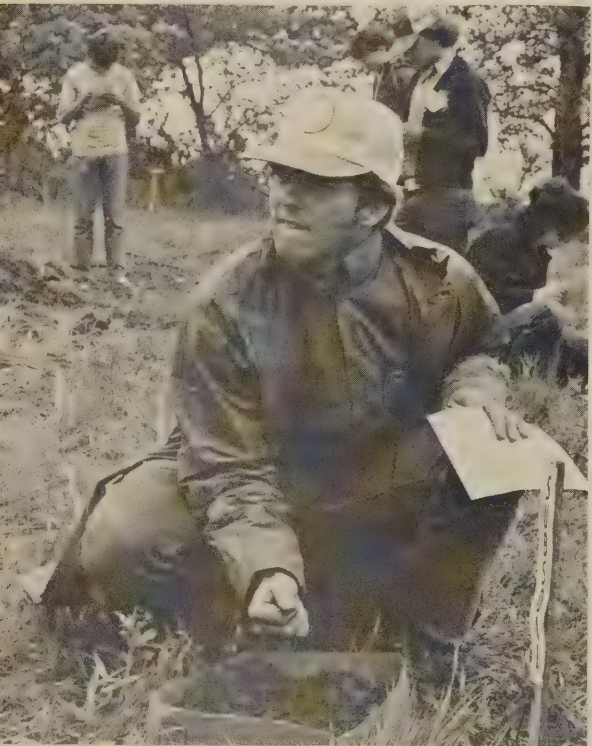
Mr. Bubb is SCS public information officer in Harrisburg, Pennsylvania.



by F. Dwain Phillips

Land Judging Contest Draws 1,000 Competitors

Hawaiian contestant Joyce Uyeda estimates slope of the land while (below) a Future Farmers of America contestant checks a subsoil sample.



Nearly 1,000 contestants competed in the 25th Annual International Land, Pasture, and Range Contest in Oklahoma City, Oklahoma, on May 5-6. Thirty-three states sent representatives, including—for the first time—Hawaii.

The contest is sponsored each year by WKY radio and KTVY television in Oklahoma City and more than 35 other organizations. The Soil Conservation Service helped set up and judge the contest.

Vinson Bogard, SCS soil scientist in Pauls Valley, Oklahoma, has helped with the contest for 19 years. "It's a lot of work," stated Bogard, "but I think it's one of the best educational processes USDA has been involved in to teach young people about conservation."

Bobby Birdwell, SCS state soil scientist for Oklahoma and official judge for the contest, said: "I have been involved in county, area, and state contests for years, but helping with the International really made me realize how many young people study our soils. I know that with this much interest, we'll always have people raising our food and taking care of our land."

The contest was divided into three categories: Adults, Future Farmers of America, and 4-H. Each team was composed of four contestants.

They judged soil texture, depth, slope, permeability, degree of erosion, and surface runoff. They then determined management practices needed

on the designated areas. Plant identification was also part of the contest.

The first day was spent in orientation and going through a practice contest to give out-of-state contestants a chance to look at Oklahoma soils.

Included in this year's contest was homesite evaluation, which provided participants a chance to recognize the hazards of some soils when houses are built on them. Features evaluated were: permeability, texture, slope, erosion, surface runoff, shrink-swell potential, water table, and flood plain. A rating of severe, moderate, or slight was given to reflect suitability of various soils for foundations, landscaping, gardens, septic systems, and sewage lagoons.

The event ended with a banquet at which winners received more than \$2,000 in cash and awards. ♦

Mr. Phillips is SCS public information officer in Stillwater, Oklahoma.

"What's your name?" is what this contestant seems to be asking as he tries to identify a plant in the range contest. Below, competitors go through a station on land judging.





"You Can't Lose"

A Colorado soil conservation district has initiated a contest to encourage farmers to take better care of windbreaks.

To participate, farmers must plant at least 200 trees at the beginning of the year-long contest and then maintain them.

During the year, each windbreak entry is judged twice by board members of the Yuma County Soil Conservation District (SCD) in northeastern Colorado.

How well the windbreak has been managed determines the score. A farmer can receive up

to 40 points for cleanliness between rows, 30 points for cultivation quality and timeliness, and 20 points for minimum tree damage. Other factors, such as land topography and cultivation difficulty, account for another 10 points. A farmer can also receive extra points for windbreaks containing more than 600 trees.

"The contest is to provide area farmers incentives to bet-

ter care for windbreaks," said Roger Shephard, SCD board member, in an interview in the *Colorado Rancher & Farmer*. "Also, we hope the contest will stimulate more interest in district conservation programs."

One of the participants last year, Jerry Hahn, said he planted 450 trees and estimated that he spent 150 hours, or about 20 working days, during the summer alone tending to the windbreak.

"The windbreak did demand a lot of time during the busy season, but I think it was worth it," said Hahn, a cooperater with the district. "After 1 year's time—the critical period for newly planted trees—I had a 90 percent survival rate. This compares to about a 70 percent survival for trees that don't receive the same amount of care."

The entry letter summed up the board's approach:

"You can't lose by entering this contest, because even if you fail to place, you will still gain by the additional growth and vigor of your planting through adequate care given to your trees." ♦

Arboretum Project Blossoms into Award

A New Jersey conservation district has become the first district to receive the National Arbor Day Award.

The Ocean County Conservation District was recognized for its efforts to establish a county arboretum. The competition was sponsored by the Arbor Day Foundation, organized in 1972 to promote a better understanding of the importance of trees as a resource.

The award was presented at ceremonies in Nebraska City, Nebraska, in May.

The district began making plans for the arboretum in response to many questions it received on the adaptability of trees, shrubs, and grasses to sandy and infertile soil condi-

tions in the county, according to Frank Bartolf, chairman of the district.

"In addition to a demonstration area, the arboretum will help schoolchildren observe and study the growth of trees and shrubs in the pine barrens," Bartolf said.

The Ocean County Board of Freeholders has agreed to set aside 10 acres of land in the county air park for the arboretum.

The district developed the plan for plantings there. To date, more than 125 trees and shrubs have been planted. ♦

Turn the pages back to 1934 to the "new" publication *The Land*. Ewing Jones, its editor, tells of his days as a "rookie," looking at soil erosion around the country. *The Land* was published by the temporary U.S. Soil Erosion Service, predecessor of the Soil Conservation Service.

A Rookie Looks at Soil Erosion

I can remember soil erosion from my boyhood days in Oklahoma. We used to have pictures of it in our geography. Occasionally we would play out near the levee north of Pauls Valley, and romp up and down the gullies. "That's erosion," we would comment, and promptly forget it.

Nowadays, since I have become inured to the atmosphere of erosion control and inoculated with the entrancing fever which seems to grab one who makes a study of this engrossing problem, the same apathy towards erosion is even more noticeable in the lay mind. Sure, we have erosion, is the general consensus, and straightway, it is forgotten.

"What do you do?" I am asked.

"Soil Erosion Service," I always say with a show of pride, "working to control erosion over the country."

"Oh, yes," is the inevitable answer, "terracing."

Then I very carefully explain that it isn't just terracing, that our work



also includes stripcropping, revegetation, rededication, and the many ramifications in the coordinated program.

This hasn't happened two or three times—but at least a dozen. It is positively amazing to note the scarcity of knowledge about just what erosion is and what is being done about it over the country.

But I must admit I had the same idea until I was initiated. We started out in the Tennessee Valley. Gus Lentz took us down a steep ravine, about 20 feet deep, I guess it was, and half a mile long. That gully had been started on purpose! It was kept alive on purpose! The owner of the farm had driven his plowshare down the center of his field two or three times to start a gully so that he wouldn't have to put up a fence to separate his fields. He got his gully—and he is getting more every year, and apparently does not care.

Another good old Tennessee Valley pioneer followed the archaic but quite popular method of running his furrows up and down the hill, and letting the land lie fallow each winter.

"Here, man," we pointed out in a burst of outraged dignity, "don't you realize that during the winter every rain carries off a sizable layer of your top soil?"

His eyes gleamed. "Sure, that gives me fresh soil to till each year. See?" That's downright pathetic.

The hills down there are plenty steep, and many should have been left in timber. Why, Mr. Batten, a small town real estate man, and a dead ringer for Eugene Pallette, told us that pencil companies had bought up the old cedar rail fences down there, sometimes paying more for the fences than the farms themselves would bring!

Across to Oklahoma. Charlie Hollopeter took us out over the Stillwater area. I asked him why it was that the grass strips bordering the fields

... three things stuck in his craw; the large areas destroyed by erosion and the utter desolation which can result therefrom, the ignorance of the majority on this major national problem, and with what small effort erosion can be avoided.

were 7 to 10 inches higher than the fields themselves.

"Come here," he beckoned, and led me out to the field. What looked like cultivable ground from the highway was really nothing but harsh red subsoil. Even sunflowers wouldn't grow on that. Sheet erosion had robbed the field of its entire topsoil—but the grass held the shoulders in their virgin profile.

We went on down to Texas, just in the wake of a 3-inch rain. In the rich black belt, on a half-acre experimental plot, Horace Geib showed us where tons and tons of fine top soil had been swept from a fallowed field by that one rain, while on an adjacent field, stripcropped with oats and cotton, the runoff was negligible; a third plot, covered with grass representing permanent pasture, showed no runoff! Yet the farmers in that vicinity protested to the state highway commission because it was using bermuda-grass to hold the shoulders along the highways.

We talked to a farmer who had seen his neighbor's contour furrowed field hold his soil during that heavy rain, while his own field was badly rilled and gullied. Yes sir, he wanted to come into the project program now. Encouragement!

Westward we continued to the Navajo. Here were encountered two remarkable "before and after" scenes in real life. One was down in a sand swept region near Jeddito, in the Keams Canyon district. Sand dunes had almost covered a "hogan," or Navajo dwelling, and were gradually creeping farther. The Navajo grinned as we gaped at the impending danger. "Pretty soon hafta build 'em higher," he commented tersely. A mile farther, we ran into quite an enterprising man by the name of Wilma Roberts. A big gully was cutting through his land—he put a stop to that with cottonwoods and willows. Sand dunes were creeping toward his home. He promptly put up simple fences, and the dunes were halted.



Another vivid scene was where a fence divided an area. On one side was a fine stand of native grasses—on the other, erosion pavement: harsh, pebbly, interspersed with a few dead tufts of sagebrush. Overgrazing had taken its toll.

We had seen photographs of bench terraces with which the Incas in the Colca Valley of Peru had controlled erosion on steep hilly lands and still cultivated them. In California we found a few duplicates, in rich citrus orchards. Some of them have been in use for several years, others were just being built, and again it was encouraging to note that someone was realizing that immediate steps were necessary if the land was to survive.

The Palouse region in Washington and Idaho is a billowy land, quite resembling ocean waves. The practice of summer fallowing these fine wheat lands was taking its toll—but where the farmers kept their steepest slopes in native grasses, or alternated their wheat with clover or peas, all was quiet on the western front and on the eastern front too, and these were income-producing crops.

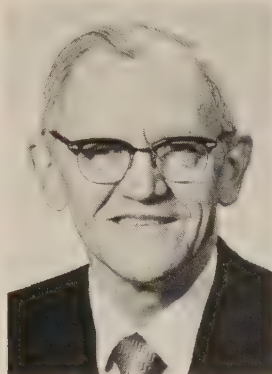
Although little has been said, much was noted over the country of the works, the varied, coordinated works, which were being applied to these problems. And as the rookie ended his initiation, three things stuck in his craw: the large areas destroyed by erosion and the utter desolation which can result therefrom, the ignorance of the majority on this major national problem, and with what small effort erosion can be avoided.

The rookie had his initiation—and it ended with the warm feeling that the days are on the wane when gully control means tossing a wornout auto body into the ditch. Uncle Sam has substituted a coordinated attack which has stuff on the ball. ♦



$A = RKLSCD$

National Soil Erosion Conference Honors Walter H. Wischmeier



On the plains of Hyderabad in India a man came up to the head of USDA's Agricultural Research Service (ARS) and asked him if he had the honor of knowing Walter H. Wischmeier.

That's one of the illustrations ARS Administrator Talcott W. Edminster used in honoring the leader of the team of scientists who developed the universal soil loss equation. Edminster spoke at the National Soil Erosion Conference at Purdue University May 24-26.

The conference focused on the prediction and control of soil erosion and honored Wischmeier on his retirement as a research statistician with ARS and professor at Purdue.

Papers presented during the conference covered uses of the universal soil loss equation, its application to other geographic areas, research to identify factor values in the equation, and its use in modeling analysis and erosion and sediment control.

"Perhaps no development has had a greater impact on the soil conservation effort than has the universal soil loss equation developed cooperatively by a team of scientists led by W. H. Wischmeier from the Agricultural Research Service and Purdue University," noted the conference program. "His assistance in helping the

Soil Conservation Service and other agencies apply the equation is a model of effective technology transfer from researchers to users."

Wischmeier used several thousand plot-years of data in developing the six-factor prediction equation.

Both SCS and ARS have further contributed to the universal soil loss equation since 1940. The equation, designed for field use by soil conservation planners and technicians in predicting soil loss from sheet and rill erosion on cropland, was extended in 1972 to predict sheet erosion from various land uses in watersheds.

More than 160 people attended the conference sponsored by Purdue University in cooperation with the Agricultural Research Service, Soil Conservation Service, Soil Conservation Society of America, American Society of Agricultural Engineers, American Society of Agronomy, Soil Science Society of America, and the Crop Science Society of America. ♦

Your Soils' Potential

The soil survey supplement for Seminole County, Florida, can be a valuable tool for private land users as well as county officials.

Say, for instance, you own 5 acres in the county. The soil survey maps show that your land is primarily Blanton fine sand, high, 0 to 5 percent slopes.

The soil survey supplement will show that, if you want to build a house on that land, you're in luck. There are very few soil properties that will adversely affect a house of three stories or less, a septic tank absorption field, or the local roads and streets around you.

This soil slides easily, however, so sides of excavations for pipelines, underground phone and power transmission lines, sewer lines, and the basement will need to be shored up. Once this is done, you can expect good performance from the soil.

Blanton soil is not good for lawns and ornamentals. It has a very low content of organic matter and a low available water capacity. You will have to follow a good management plan, including such practices as fertilizing and irrigating, to obtain fair to good results.

As you may suspect, your hopes for a flourishing vegetable garden may well be dashed. This soil has a very low potential for cabbage, carrots, celery, cucumbers, lettuce, snap beans, and all the other vegetables grown in Seminole County. Even with good management, the soil is not likely to produce an adequate vegetable garden.

If you want to excavate a small fish pond where you had originally planned to put your vegetable garden, you're out of luck on that score, too. The soil is

too sandy and too deep to ground water, and no practical practices are available to fill up an excavated pond.

If these 5 acres are part of your farm, the soil survey supplement can help you decide the most profitable crop to grow there.

The soil's low natural fertility and very low content of organic matter give it a low potential for improved pasture. You can try good management, but the results will be poor or unreliable.

You can expect fair to good results if you use these 5 acres for commercial wood production.

Again, you will have to use good management, which may involve practices that have to be maintained or practices that are more difficult or costly than average, but the supplement shows that the average height of the dominant pine trees at age 50 (the site index) will be 80 feet.

Citrus is your best bet for farming this soil. Although it has a low available water capacity and is low in natural fertility, this soil has a high potential for citrus. If you practice good management, you can expect good results. ♦

Pilot Study Concentrates on Soil "Potentials"

by William Kercher
and Fred Merrill

Much of the land in fast-growing Seminole County, Florida, has severe soil limitations for nearly any type of development.

Yet the population of Seminole County has increased at the rate of 7 percent a year during the last 25 years and is expected to double to 300,000 by the turn of the century.

Where and how can such growth be accommodated? That's a question that has challenged officials here . . . and one that they've begun to answer.

An initial step was the publication last September of a supplemental soil survey in which soils are described in terms of their potentials as well as their limitations. County officials felt this would result

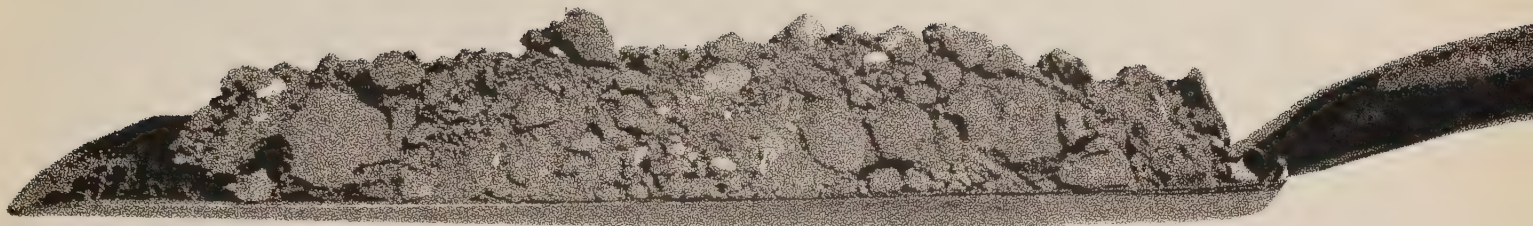
in land use plans compatible with community needs.

Many county and federal officials participated in Florida's pilot study on soil potentials. They represented planning, engineering, and other disciplines.

The information gathered is being used to develop the comprehensive plan for the county required under the Seminole County Comprehensive Planning Act of 1974.

Once adopted, the plan will guide all future land use changes in the county.

The "soil potentials" approach recognizes not only the limitations of the soil but also



considers the problems and the ease and cost of overcoming the limitations.

The soils were put into one of five categories for each of 14 specific land uses and scored from 0 to 100. A soil with a high water table which could be corrected by proper drainage could earn a "high potential" score of 85. Using the "limitations" system, such a soil would have been rated "severe" because of the high water table, and the user left to judge how the soil would react if the limitations were overcome.

The Soil Conservation Service (SCS) played a key role by providing technical assistance. This exercise reflects a contribution from the many disciplines in the Service. SCS and the Florida Agricultural Experiment stations had prepared the detailed soil survey of the county in 1966. However, this was primarily an agricultural document. It needed updating to include interpretations for many other land use decisions required by increasing urban population.

The Seminole County Soil and Water Conservation District (SWCD) assigned the project top priority, enabling the

work to be completed quickly. Secretarial help was secured through an agreement between the county commission and the SWCD.

The Board of County Commissioners, which was receptive and enthusiastic about the project, provided \$1,800 to print 1,000 copies of the supplement.

The county planning staff was designated as the responsible county agency and worked closely with the SCS technical staff. The role of the county was primarily to determine how soil potentials could be used most effectively in recognizing and resolving soil-related problems in Seminole County. The county land development administrator and the county engineer helped determine how to best use the results of the work.

The use of the "potential" approach to soil interpretations appears to be far reaching in Seminole County. Last January, sessions were held to introduce the concept to staff members in the planning, land development, tax, engineering, and building inspection departments. Each department is

using these interpretations for day-to-day operations.

The county assessor is exploring the possibility of basing land appraisals on potential uses rather than existing uses. The county engineer plans to use the approach to plan roads for soils with limiting properties. The land development department is planning to use it as a tool for county subdivision regulations.

A workshop was held last April to explain the concept of soil potentials and the use of soil survey information to consultants, developers, and others in the Orlando area.

The East Central Florida Regional Planning Council is interested in expanding this information to the six counties in its region.

And Disney World is looking at this procedure for identifying soil potentials for future developments in Florida. ♦

Mr. Kercher is county planner,
Seminole County, Florida.

Mr. Merrill is SCS district conservationist in Orlando, Florida.

Dam of Plenty

by LaVerne S. Anderson



From the air, it looks like a green patchwork quilt. Each "patch" is a garden, planted by Bloomfield, Connecticut, residents, in the 250-acre floodwater storage basin park behind Tunxis Reservoir.

Tunxis Reservoir was built in 1962 as part of the North Branch of the Park River Watershed Protection Project north of Hartford. The dam is one of four floodwater retarding structures constructed with Soil Conservation Service technical planning and financial assistance under the P.L. 566 Watershed Protection and Flood Prevention Act.

Bloomfield residents signed a 50-year lease with the Connecticut Department of Environmental Protection to use the floodwater storage basin. The state restricted the use of the

land to things that would enhance or be indigenous to the surrounding environment.

Part of the park is a 22-acre lake, stocked with largemouth bass. It has become a popular fishing site. Three hard-surface tennis courts were added to the flat area at the upper part of the lake. A sizable marsh inhabited by numerous forms of wildlife has attracted outdoor buffs who have developed wildlife trails through the marsh and adjacent wooded areas. Recently, the Bloomfield Parks and Recreation Department organized a summer day camp

for children and added picnic shelters and an archery range for their use.

Most town planners would consider this multiple use of a floodwater storage area as adequate and be satisfied. But Bloomfield found still another use for the area: the do-it-yourself gardening project.

It was started by George Bruhns, a member of the Bloomfield Advisory Committee on the Environment (ACE). He and his wife Eleanore had seen a community gardening project in Mrs. Bruhns' native Germany while vacationing there. After returning home, Bruhns suggested a similar gardening project for the Tunxis Reservoir floodwater storage area park to his fellow committee members. They

At Bloomfield's popular community garden, Janet Hall ties up tomato plants in her garden plot while Ross Wathne loosens soil after a rain.



agreed with the idea and it was approved by Harold Barenz, director of the Parks and Recreation Department.

In 1974, the pilot garden transformed a grass and weed laden field into a half-acre of 50 fertilized and tilled 20-foot by 20-foot garden plots. These plots were assigned to interested families on a first-come basis.

The success of the first garden, combined with increased food prices and a "back-to-the-land" attitude, helped increase the number of 1975 gardeners to five times as many as participated in 1974.

Several loads of cow manure were donated to the project by the A. C. Peterson Farms, one of the many cooperators with the Hartford County Soil

and Water Conservation District. Leaves from town properties were dumped at the site to help enrich the soil. The manure, leaves, castor pomace (for nitrogen), and 6 tons of granite dust (for potassium) were hauled and spread by town employees with town equipment. All this material helped correct soil deficiencies noted by the Connecticut Agricultural Station soils analysis.

Last fall, soil tests showed nitrogen to be the only deficient plant nutrient. This season an ample amount will be added to the fertilizer program to assure an adequate balance of all nutrients to stimulate a successful crop.

Last season, a volunteer plowed the land using his own equipment. A sawmill donated

stakes and a Saturday morning volunteer working party, assisted by Town Surveyor Jesse Branch, divided the garden into ready-to-plant plots.

A group of 20 workers picked up debris, such as stakes and strings, from the plots.

Anxious to see the project continue, Bloomfield's Town Manager Clifford Vermilya suggested that the Community Garden Club project become a town-sponsored but financially independent club. Club officers were elected last July, bylaws were adopted, and assessments were set for the 1976 garden. Garden section leaders, overseers of 45 plots each, were chosen and a mail-in plot renewal system developed.

Parks director Harold Barenz described the project's success: "Hauling gardening tools across town didn't seem to discourage people. They kept coming even in the hottest weather. Most families grew enough fresh vegetables to keep their families supplied all summer. Others canned or froze vegetables for the first time. One ambitious boy even raised an extra supply of vegetables to sell so he could have extra spending money."

Jim Tomasek, the Community Garden Club's first elected director, is enthusiastic about the success of the project. He feels a bountiful harvest for many families is only one of the benefits for Bloomfield. New friendships, the gratification of people working with other people, and a greater appreciation of our natural resources may be even more important. ♦

Mr. Anderson is SCS district conservationist in Warehouse Point, Connecticut. His story on the community garden appeared in The New York Times this spring.

Wyoming Ranchers Coordinate Conservation on Public and Private Lands

By Dann A. Fosher and R. Steve Scheldt

Two Wyoming ranchers could probably add a few more paragraphs to the dictionary definition of "cooperation."

They've worked with five federal and state agencies to develop a coordinated resource management plan—the first in south central Wyoming.

The plan covers 28,000 acres—including not only the land owned by Ken Carrico and his son Gene but the 900 acres they lease from the state and the 23,000 acres of federal lands for which they have a grazing permit.

The Carricos initiated the coordinated plan 2 years ago after they entered into a Great Plains Conservation Program (GPCP) contract with the Soil Conservation Service to apply conservation practices to their private land.

They knew that the contract, which obligated \$25,000 in GPCP cost-share money, would be more beneficial if needed practices were also applied to the land they lease and graze under permit.

The Carricos' desire resulted in the coordinated resource management plan—a plan for an operating unit that includes private land intermingled with state leased land, and federal land grazed under permit.

Nearly 3,000 ranches in Wyoming contain land leased from the state or grazed under permit from the federal government. Seventy of these now have coordinated resource management plans.

The Carricos, as cooperators of the Little Snake River Conservation District, requested the plan through the district. Par-

ticipating agencies met in the summer of 1974 and outlined policies, legalities, and planning constraints. These agencies are USDA's Forest Service and Soil Conservation Service, the U.S. Department of Interior's Bureau of Land Management, the Wyoming State Land Commission, and the Wyoming Game and Fish Department.

They then worked out a plan for the ranch to meet its many and varied challenges. These include:

- fencing which will not impede big game migrations

- brush management patterns which will yield more grass for livestock but not destroy elk calving grounds or preferred wildlife browse species, such as bitterbrush and serviceberry
- a grazing system to incorporate summer use on subalpine ranges, and spring-fall use on desert ranges

- water developments to improve livestock and wildlife distribution.

The Carricos decided to change from a sheep to a cattle operation to facilitate the scheduled six-pasture rotation grazing system. Several cross-fences will divide the ranch, which at one time consisted of one 28,000-acre pasture.

State and federal agencies agreed to furnish materials needed to install improvement

practices planned on the leased land.

The resource data accumulated for the plan also provided information for the Environmental Analysis Report required for any improvement practices scheduled on federal land.

Each year, the Carricos and agency employees revise the plan to reflect changed resource conditions, livestock needs, and the operator's desires.

Today, many improvements can be seen on this ranch in the foothills of the Sierra Madre in the Rocky Mountains. Sagebrush is chemically controlled on 1,200 acres, proposed fence-line right-of-ways have been made, and surveys for pond and spring developments have been completed.

In addition, the Carricos and specialists from the various government agencies keep a close watch on the land to protect it from overgrazing. They've placed utilization cages in strategic locations and clip and measure the vegetation in the cages annually to monitor both grazing use and the rate of recovery of the rangeland. ♦

Mr. Fosher is SCS district conservationist in Baggs, Wyoming.

Mr. Scheldt was formerly SCS range conservationist in Kemmerer, Wyoming, and is now SCS biologist in Grand Junction, Colorado.



SCS and Forest Service technicians clip the vegetation in the utilization cages annually to monitor grazing use and the rate of recovery on the rangeland.

Assembly Line for Seedlings

by Boyd A. Ruth

It is an assembly line that would have pleased Henry Ford himself.

Eighty volunteers were handling 320 tree seedlings every 60 seconds, wrapping them into bundles of 40 seedlings each at a rate of two bundles every 15 seconds.

The occasion? "Tree packing day," which is sponsored each

April by the Licking County Soil and Water Conservation District (SWCD) in Ohio.

"We've come a long way—from selling 11,000 trees in 1966 to nearly 130,000 this year," according to coordinator Gordon Postle, executive sec-

retary of the Licking County SWCD.

The district sponsors the nonprofit event to supply seedlings for wildlife plantings in a 10-county area in central and eastern Ohio.

It takes advance orders, buys the seedlings from private nurseries, and makes up the wildlife planting packets.

The district offers two packets. One contains 45 evergreen seedlings of pine and spruce species. The other contains 40 shrub seedlings, including American holly, Russian olive, and Chinese chestnut. It's an international combination selected for its regional adaptability and usefulness to wildlife.

Volunteers select the various seedlings for a packet, wrap them in plastic, add moistened sawdust to protect the roots, and tie each packet with twine.

Volunteers during last April's tree packing day included suburbanites, Scouts, 4-H Club members, farmers, the Licking SWCD staff and board of supervisors, and Soil Conservation Service and Ohio Cooperative Extension Service employees.

They met south of Newark at Dawes Arboretum, which provided facilities. The Mound-builders Kiwanis Club furnished coffee and doughnuts.

"It's the folks who volunteer to wrap the trees that help make the packet program successful," said coordinator Postle.

"These volunteers are providing a benefit to wild creatures and all mankind. This is what resource conservation is all about." ♦



Mr. Ruth is SCS district conservationist in Pomeroy, Ohio.

Lake Liberty



Don and Christy Anderson at the dedication of Lake Liberty.

In celebration of the Bicentennial, Oklahoma has named its 1776th small watershed reservoir Lake Liberty.

Near Ada, the lake was dedicated at ceremonies attended by more than 1,400 people last May.

Lake Liberty is formed by the 1776th floodwater retarding structure to be built in Oklahoma under Public Law 566, the small watershed program, and the Washita Flood Control Program, both administered by the Soil Conservation Service. The lake has 28 surface acres and has 3,000 acres in the drainage area above the dam site. The dam is the 27th to be completed out of 33 planned on the Sandy Creek Watershed.

Don and Christy Anderson, owners of the ranch on which the lake was built, are cooperators with the Pontotoc County Conservation District. They have worked with SCS biologist Gary Bullard to plan for wildlife habitat development around the lake. Anderson also plans to use the lake for irrigation. ♦

Meetings

July

- 10-14 American Association of Nurserymen, Inc., Boston, Mass.
- 11-15 American Society of Landscape Architects, San Diego, Calif.
- 14-17 Izaak Walton League, Baltimore, Md.
- 26-29 Sixth Annual Trade Fair & Fertilizer Conference, Cincinnati, Ohio
- 26-30 Symposium on Urban Flood Plain Management, Lexington, Ky.

August

- 1-4 National Association of Conservation Districts 1976 Northeast Regional Meeting, New Carrollton, Md.
- 1-4 Soil Conservation Society of America, Minneapolis, Minn.
- 10-12 Symposium on Inland Waterways for Navigation, Flood Control, and Water Diversions, Fort Collins, Colo.
- 15-18 American Agricultural Economics Association, University Park, Pa.
- 15-18 National Farm and Power Equipment Dealers Association, St. Louis, Mo.
- 15-19 National Association County Agricultural Agents, Richmond, Va.

September

- 8-10 Chesapeake Section, American Water Works Association, Ocean City, Md.
- 9-13 American Horticultural Society Congress, Philadelphia, Pa.
- 12-17 State Conservationists' Annual Meeting, Kansas City, Mo.
- 19-24 American Fisheries Society, Dearborn, Mich.
- 20-24 International Association of Game, Fish, and Conservation Commissioners, Dearborn, Mich.
- 26-30 Association of Conservation Engineers, Wrightsville Beach, N.C.
- 27-
Oct 1 American Society of Civil Engineers Annual Convention, Philadelphia, Pa.
- 29-
Oct 2 National Conference of Editorial Writers, Hilton Head, S.C.
- 30-
Oct 5 Farm and Industrial Equipment Institute Annual Convention, Boca Raton, Fla.



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